A SYSTEMS APPROACH TO DECENTRALISING POWER FOR ORGANISATIONAL EFFECTIVENESS.

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DECLARATION

I, Rechard Noor submit this thesis for the Degree of Master of Industrial Administration. I claim that this is my original work and that it has not been submitted in this or any similar form for a degree at any University.

Signed by candidate

ABSTRACT

Organisational effectiveness has become more and more of a prerequisite in today's demanding and ever changing business environment. The democratisation of our country and mobilisation of unions whose demands includes the implementation of workplace forums has given rise to the need for business to re-evaluate the way management practices and decisions are being carried out.

These demands have placed a significant strain on our company, Howden Air Industries, the company under review. The company has been through turbulent times during the past three years with downsizing, restructuring and retrenchments being the major focus of management's endeavours to reverse the losses which have been produced thus far. The situation however further declined due to a very autocratic approach by management and a lack of long-term strategies for implementing systems and controls to achieve the desired effect of increasing productivity for long term growth.

Many attempts have been made to restructure the organisation without much success. Often key employees were lost due to retrenchments as the focus has always been on cutting costs by eliminating people. Needless to say the complexity of the situation and the demands placed on us by an ever changing business climate has resulted in a review of strategy. The simplistic methods of the past no longer appear to be working and the autocratic styles of the management team at Howden Air Industries failed dismally. The relationship between management and employees had reached an all time low and the long term sustainability of the company was a longway from being guaranteed.

This ailing state of the company has raised many concerns at all levels of the company. At an executive level the competency of the management team was being questioned, as the lack of profitability was affecting the overall performance of the Group. The local team acknowledged the seriousness of the situation but lacked the tools and vision to handle the complexity of the problem. The employees on the other hand had lost the trust and confidence in both local and executive management as their jobs and livelihoods were seriously threatened as the company further declined.

Key staff were resigning and important skills were lost. The problem therefore was to find a solution which would radically transform this company into one which could:

a) Handle the complexity of managing in today's turbulent times.

b) Create a culture of team work and participative management, and

c) Ensure the long term sustainability of the company.

The questions raised by these concerns were:

a) How can the complexity of the situation and management in general be handled in the future.

b) How can the autocratic practices of the past be changed to create trust between management and the workers.

c) How can long-term sustainability be achieved.

To view these questions in isolation would be in contradiction to the arguments raised in this report. For this reason I have proposed a solution which attempts to show the interconnectedness of the problems which these concerns have raised. The report essentially proposes a scientific method of inquiry to handle complex situations, which is then used in an attempt to highlight the need for the decentralisation of power within complex organisations. It follows a systemic approach which regards each department as having an effect on each other as well as the larger environment.

This concept which is discussed in more detail in this report together with an investigation of the organisation on its ability to overcome its problems seemed like a possible solution given the current situation in South Africa and in particular the introduction of workplace democracy.

Chapter 1 introduces the reader to the company together with a theoretical discussion on the internal markets model which is extensively used in decentralising power within Howden. Having been exposed to Systems Thinking and using these techniques at the company soon highlighted the fact that the company's attempts had failed in the past due to the lack of learning which took place. Often mistakes were repeated and empire building surfaced when things went wrong. In his book The Fifth Discipline, Peter Senge refers to this as the learning disability which is also described in the description of the problem situation (Senge 1990).

Chapter 2 describes The Philosophy of the Model, followed by an introduction to the methods incorporated into the Model of Inquiry (Chapter 3) and Chapter 4 shows the relevance of system thinking in this thesis and management research in general.

The Model is a synthesis of the works of Charles S. Peirce, C. Handy, Mumford, Minto and Prof. Ryan. In particular the SCQARE method developed by Prof. Ryan allows one to present the problem by firstly describing the Situation which gives rise to a Concern regarding the Situation. The Concern in turn gives rise to Questions which leaves the inquirer the task of finding Answers in resolving the Situation. As the course is built on Systems Thinking the inclusion in the model is a prerequisite. The beauty of the model is that the process of inquiry is open-ended and its cycle is only complete if defined by the inquirer. The model is tested by applying it to a complex problem of improving organisational effectiveness at Howden Air Industries. Included in the model is a description of Soft Systems Methodology , a modelling process developed by P. Checkland for investigating problem areas in organisations using a diverse range of perspectives.

The application of the framework is then used to inquire into the Situation at Howden Air Industries by sweeping in on various levels in the organisation using the interview methods. This section of the report is concluded with a Hypothesis which sets the tone for defining the changes which are required in achieving long term sustainability (Chapter 6).

In Chapter 7 the Hypothesis is then tested theoretically by analysing similar projects which had been undertaken by other companies within Howden Africa both successfully and on one who failed in achieving success. This section explains in detail each project from discussion phase through to implementation and a brief summary of the results achieved as well as theoretical predications of the results expected by implementing the project at Howden Air Industries.

In Chapter 8 a practical test is then carried out with a detailed description of the project embarked on at Howden Air. The need to sustain the organisation was immense and the co-operation achieved remarkable. The benefits achieved namely that of the privatisation of Tempco Engineering formerly a department of Howden Air is documented which proves the Hypothesis to be correct.

This thesis is concluded with a reflection on the use of the model and the learning process, a critical analysis of the case studies and the Hypothesis.

It must be said up front that I have been on this course for three years and have been exposed to very dynamic management tools. Having used the Framework and parts of the Internal Markets Model philosophy in the past has led me to assume a certain amount of knowledge. I have however attempted to include the information in my thesis to show the relevance in my research as well as not to leave the reader with having to make assumptions. I mention this as I feel at times my views may appear to be predetermined, but have been as a direct result of using the method of inquiry in obtaining my post graduate diploma.

To simplify the application of the model I have included a fold-out model at the back of the thesis for the reader to refer to when checking the various stages of development. At the beginning of each major section reference is made to the various stages as highlighted in the model.

At the conclusion of each part is a mind-map giving a diagrammatical representation of the topics discussed and ties the logical flow of the section together.

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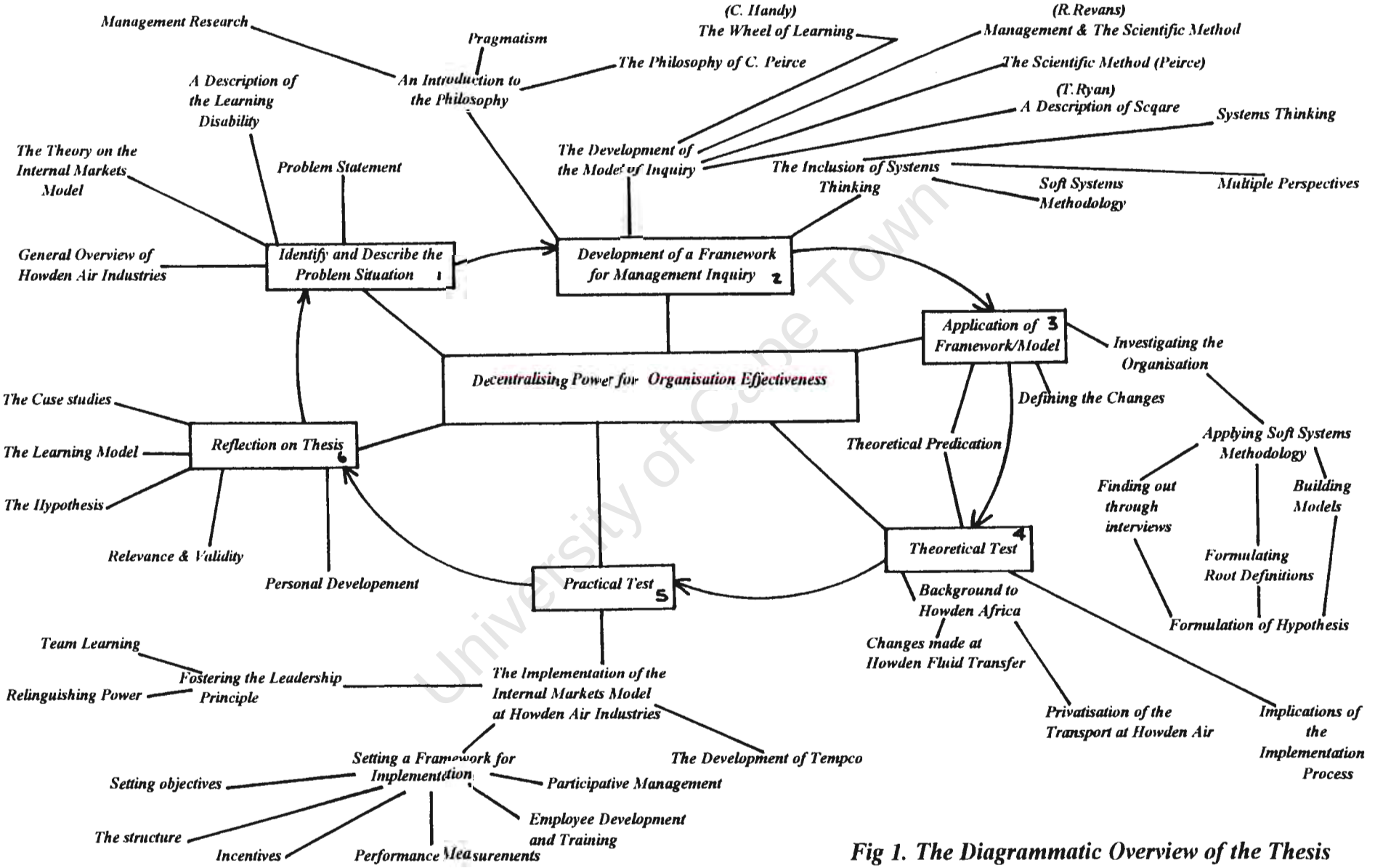


Fig 1. The Diagrammatic Overview of the Thesis

PART 1

CHAPTER 1

UNDERSTANDING THE COMPANY AND A DESCRIPTION OF THE PROBLEM SITUATION

THE COMPANY UNDER REVIEW

1. INTRODUCTION

In prior investigations carried out during the development of my technical report many short-comings were highlighted contributing to a decline in the company being reviewed. Some two years ago a productivity enhancement program was embarked on at Howden Air Industries in an attempt to increase it's profitability. It soon became apparent that the use of a mechanistic form of management to solve the many complex problems which existed in the company was not going to work. Having been exposed to System Thinking and its related process, I introduced the company to the Internal Markets Model which at the time was a premature move. In my opinion one of the major weaknesses is the fact that the company has made many attempts at restructuring the organisation with little effect or benefits being achieved. This I believe is as a direct result of what Peter Senge refers to as a learning disability which will be discussed later in this report (Senge 1990).

In part 1 an overview of the company is given together with a discussion on the IMM and the theory behind the learning disability in an attempt to create an understanding of the situation at Howden Air Industries.

1.1 GENERAL OVERVIEW TO HOWDEN AIR INDUSTRIES

Howden Air Industries is a company which was formed about 3 years ago through the merging of three individually operating organisations. The companies were previously know as: Luft Industries, Yucon Coil Company and Ventline Manufacturing.

The various functions and products produced by the above companies complimented each other in many aspects which created the opportunity for the merge to be a reality.

The mix of products previously manufactured at the respective individual companies all targeted the air conditioning and refrigeration industries. From a business point of view it made perfect sense to establish this company with complimentary products and a diverse market to enhance its chances of being the number one company within the market place.

The present company consists primarily of a manufacturing operation and sales outlets which are supported by human resources, accounting, finance and marketing functions. The head

office and factories are situated in Montague Gardens, Cape Town with sales branches in Johannesburg, Durban and Port Elizabeth. The manufacturing aspects of the organisation consists of two factories viz. The components manufacturing and assembly factories. The component factory consists of metal fabrication, coil production, CNC punching operations, welding. The assembly factory consists of assembly lines and spray painting. Situated on these premises are the stores warehouse which stocks completed goods imported from various overseas suppliers.

The products all trade on brand names which are well established in the market place. The Luft product range includes fans, roof units and attenuators. Yucon range includes air handling units, blower coils, air cooled condensers, water-packaged chillers and pressure vessels. Ventline includes various configurations of air diffusers. Also included in its range are imported brand names like Vortice, Nicotra and Sodeca.

The establishment of Howden Air Industries was seen as a critical move in developing a market leader able to withstand the onslaught of any competition and to service a very diverse and demanding industry. Needless to say, this did not come without its problems, most organisations are very complex systems which must be managed with the many forces acting against each other. The long standing fallacy of sales and production being enemies was overlooked in favour of 'inter company' differences where employees could not forget the past and still referred to the previous companies as the core business.

The cultures within each sector of the companies were so different that any thought of this company being successful was laughable. A turbulent three years have passed with many changes having taken place. Reorganisation of management structures, employee development, restructuring and participative management were a few which has been contributing to synthesising these radical cultures into one which has a common belief and principle.

Although major steps were taken to return the company to a profitable situation, long term sustainability is not guaranteed. The major decline of the South African economy and strong external competition has given rise to declining market share with reduced profits. The emergence of the new South Africa has given rise to empowerment, workplace forms, democratisation and power sharing.

Howden Africa, the parent company of Howden Air Industries has a philosophy of true empowerment of all employees by decentralising power for improving organisational effectiveness. Having been through many attempts at restructuring, which often had an adverse effect on the company, raised the need to turn the organisation into a more profitable one.

It recognised the need to change it's management style from an autocratic style to a participative style. It's bureaucratic hierarchical structure was not working and confrontation between management and the workers was becoming more and more of a problem. The retrenchments of the past had driven a wedge between the two and a climate of mistrust was eminent. The declining state of the company however instilled a sense of urgency throughout the workforce and a serious attempt was made to foster a better working relationship. To this end management had made a sincere effort to include all the stakeholders in it's discussions and investigations on how to reverse the situation. Given the South African situation of democratising the workplace management saw the implementation of the Internal Markets Model as a perfect opportunity of achieving this objective. The change process however would require a drastic paradigm shift at all levels of the company as it would mean management having to relinquish some of it's power and the workers having to accept more responsibility. This I believe was going to be the major stumbling block in achieving success as the maturity of both management and workers had to be developed.

As this thesis is a development of my technical report I need to give some background to the topic being discussed. This part of the report will introduce the reader to the Internal Markets Model which is the basis of the investigations carried out in Part 3.

1.2 THE INTERNAL MARKETS MODEL

Introduction

The internal market model is a conceptual model based on the principles of improved organisation learning, cross functional two-way communication and entrepreneurial culture. The archaic large centrally controlled hierarchical structures need to be transformed to a more flexible, open ended relationship and power sharing form of management in order to keep up with the ever changing fast moving needs of the business environment. A paradigm shift in the way we think about and manage the workforce.

The model facilitates the need for an organisational system that models the market place and allows for greater employee autonomy, accountability and ownership.

The mechanistic form of management, which has been used by most large organisations since the industrial revolution, no longer seem to be working. This management system does not suit the more complex environment of the world today that includes a :

- Demanding and educated work force
- Discriminating, informed consumers

•Intense local and global competition

•Rapid technological changes

•Energy crisis and environmentalism

The inability to change rapidly and adapt appears to be linked to the rigid hierarchical structure and central control in most traditional organisations.

The fundamental question arising out of these concerns pertaining to the Internal Markets Model are:

What are the basic principles of the Internal Free Market Model?

Why would an Internal Free Market Model be required?

To answer the above questions:

Profound change is required in the way we organise, structure and view organisations. Hierarchical central control with its accompanying bureaucracy, lack of flexibility and creativity should be replaced with organisations structured or modelled on market forces.

The Internal Free Market Model hinges around 3 Main principles namely:-

Transform the hierarchy into internal enterprise units

Organisations are no longer divided into departments or divisions but into entrepreneurial or business units. These units are independent autonomous structures that can compete and adapt to a rapidly changing environment much more quickly and innovatively than traditionally centrally controlled organisations. Managers are fully accountable but also have a high degree of autonomy that releases creativity and entrepreneurial actions. Rewards are high for performance through, for example incentive pay, stock plans. Conversely, lack of market success could result in dismissal or failure of the unit.

Examples of new structures are:

•Internal job shops - Manufacturing

•Profit Centres Information systems or research & development

•Work teams - Self managed teams that share in gains

Create an Economic Infrastructure to guide decisions

Smaller profit and loss centres working autonomously, highlight problem areas that previously were obscured by central control. Smaller units are also more flexible and able to harness all the individuals in the unit more effectively. Structures such as profit centres force line centres to evaluate their needs rather than waste resources. Profit centres must also become competitive, if not already, as other centres have the choice to source elsewhere. Social structures must also be changed to ensure the necessary entrepreneurial culture and that

employees are encouraged to introduce and drive changes required by the market. Examples of structural changes could include a share in gains of the business unit concerned.

An environment of continuous learning and knowledge sharing to enhance adaptability to the market must be part of any strategic change.

Provide Leadership to Foster Collaborative Strategy

The role of top leadership is to create synergy without central control. It is not a laissez-faire system, but rather provides processes and support to enable business units. It is also focused on the function of encouraging independence where profitable. It also creates collaboration between units in order to serve the market better.

Reasoning

Why would the IMM be required?

To replace the Mechanistic Era with an Information Age and a new dynamic organisation structure that can be adaptable, flexible and agile in a rapidly changing environment.

It will allow for braking down the bureaucratic form of management into entrepreneur ship and creative synergism parts.

It will provide a foundation for organisations to withstand the challenges of the 1990's. Viz. Globalisation of markets and intense competition Rapid technological changes, shifting political influences

A competitive edge can be obtained with smaller units focused on market objectives and eliminating layers of management resulting in cost savings

The Benefits of the IFMM

Internal competition stimulates growth internally leading to higher profits for the larger organisation.

Employee autonomy can be achieved through profit sharing and self management.

Individual development created through shared responsibility.

Ownership of the free markets concept results in proactive response resulting in higher productivity.

Provide freedom and support that enables entrepreneurial ship.

It enables organisation learning and shared problem solving with a focus on a common objective.

Enables entrepreneurialship.

It enables organisation learning and shared problem solving with a focus on a common objective.

1.3 HOWDEN AIR INDUSTRIES AND THE LEARNING DISABILITY

Howdens attempts at restructuring its organisation has failed on all previous attempts during the past three years. In all cases the loss of jobs further reduced the chances of long-term sustainability as an atmosphere of mistrust and unhappiness was created and confrontation between management and the workers became more apparent. Departments starting to group together as a team and worked hard at defending their territories at all times. What happened in other departments was not even discussed. A syndrome of passing the buck was growing stronger day by day and any opportunity to abdicate responsibility was explored.

Management became so overwhelmed by the declining state and started focusing on how to combat the opposition companies and neglected the internal conflict that was developing. Throughout the company management disregarded the input of individuals and became autocratic and defensive when questioned about its management styles, they became engrossed in the external factors and overlooked long-term planning for future development. Employees were seen as part of the problem with many seen as spies for opposition companies. Short term thinking was the order of the day and one crisis was followed by another.

Staff turnover was increasing, management was being chopped and changed and yet the ailing state of the company did not improve.

Understanding The Learning Disability

Having concluded prior investigations on the organisation it has become apparent that the company would have difficulty in successfully implementing this project. In my opinion one of the major weaknesses is the way in which the organisation is being managed. Because of the differing cultures the ability to work together has led to many confrontations between departments as well as management and the workforce, this is as a direct result of what Peter Senge refers to as the learning disability.

Howden Air has gone through retrenchments, restructuring, management changes and various projects in the hope of moving from a loss situation to a profitable organisation. Some have been successful but many have failed.

To put this learning disability into perspective we need to discuss the concepts as detailed in his book The Fifth Discipline (Senge 1990).

Symptoms of the Learning Disability.

In most companies that fail there is abundant evidence in advance that the organisation is in trouble. Many managers would identify quite easily with many of the problems but overall

the organisation does not recognise the impending threats, understand the ramifications or come up with solutions.

In South Africa today many companies are being threatened by what many believe to be a declining economy and the weakening of the rand is placing us all in the spotlight. Unfortunately many organisations have fallen prey to what Senge refers to as the learning disability. He goes on to say that this is no surprise. The way they are designed and managed, the way peoples jobs are defined and most importantly the culture which has evolved in our teachings on how to think and interact, creates the learning disability (Senge 1990).

Its easy to justify problems and why progress is slow, but the demands being placed on business by shareholders and unions alike are growing day by day. What is needed now is a more urgent, imaginative and real commitment in order to transform our company, and, to a larger extent our country. The significant problems facing management cannot be solved at the same level of thinking at which these problems were created. As we observe the organisation and recognise the problems we will soon discover that these are deep fundamental problems that will require a new art of management to solve. A paradigm shift which will radically change our beliefs on the way we manage (Senge 1990).

We need a new level, a deeper level of thinking, a paradigm based on principles that accurately shows the interacting prevalent in business today.

A summary of Senge Symptoms of organisations suffering from a learning disability is explained.

'I am my Position'

Most employees are trained in there jobs, so much so that they confuse them with their own identities. When asked what they do for a living, most people will describe the task they perform everyday, not the purpose of the organisation of which they are a part. Most see themselves as numbers within an autocratic system over which they have little or no control. The responsibility which governs most employees are limited to the scope of their functions and no further. A typical example would be the high reject rates experienced within Howden Air. Many employees respond negatively when questioned about this and shrug off the responsibility to a higher level of management. When people in organisations focus only on their positions, they become self centred and have little sense of responsibility for the results produced when all positions and departments interact in some way or another and impacts on the end results, irrespective of the position.

This syndrome has become evident in Howden Air with interdepartmental fighting. At a management level who can be the bosses buddy is more important than the overall problems in the company. The conflict between unions and supervisors has further demonstrated this protection of one's territory.

The enemy is out there

Is it not ironic that not only in business but in everyday life from childhood to parenthood most people find it hard to accept blame for anything which can be passed on to someone else?

In business we often find an external agent to blame. Sales and marketing will blame manufacturing, manufacturing blames engineering, engineering blames sales. This syndrome is evident of 'I am my position' described above and highlights a non systematic way of looking at the work that it fosters. A typical example is the late deliveries which are often blamed on production, but is really caused through a lack of systems and poor communication between departments.

This syndrome ultimately leads to in-house political fighting where individuals go out of their way to protect their territories and takes the eye off the ball. Management has gone beyond the boundaries of our business and focused on customers and competitors as enemies leaving little time to focus on what has to change internally. Instead we waste our time fighting the enemy which most of the time lies within ourselves.

The illusion of taking charge

Taking charge in many organisations is stimulated by the need by a manager to display some form of power and authority. What happens frequently in companies facing the learning disability is pure fire-fighting rather than proactive management. Most times problems arise and managers automatically see the need to react. This is pure re-active management and not proactive as some managers would love to believe. True pro-activeness comes from seeing how we contribute to our own problems. It is a product of our way of thinking, not our emotional state of mind. This has been a fundamental problem in Howden. Often when things go wrong the employees are the ones who are criticised when the root cause of the problem is invariably a lack of true visionary leadership. When this happens the autocratic management styles soon surface and management starts calling the shots.

The fixation of events

Conversations in organisations are dominated by concern with past events, for example, last months sales, new budget cuts, retrenchments, the new product being developed and so on. Senge emphasis that these events leads to explanations which distract us from seeing the longer term patterns of change that lie behind the events and from understanding the causes of those patterns. Management has been to involved in trying to fire-fight and find fault with individuals. A close door policy where short sighted planning takes place has resulted in a loss of long-term vision on how to transform the organisation.

The major threat to many organisations is not a spontaneous series of events but from slow, gradual decline. Learning cannot be sustained in an organisation if people's thinking is dominated by short term events. This has been evident in the absence of a short, medium and long-term business plan which any business has to have if it is serious about change.

Learning to see slow, gradual process requires slowing down the frantic pace and paying attention to the subtle as well as the dramatic. The situation at Howden is dominated by fire-fighting management rather than visionary leadership.

The delusion of learning from experience

We all learn from our experiences, this only happens when our experience has an immediate consequence. This theory fails when events only have consequences which happen in the distant future.

Herein lies the core learning dilemma that confronts organisations. Most organisational decisions have consequences that stretch over years or even decades.

Failing to overcome the learning disability

All to often many organisations fail to accept the fact that they are threatened by this learning disability. Poor performance of the company is blamed on sales which are down, labour cost being too high, suppliers rocketing prices and competition slashing prices.

Most managers fair well in teams when day to day operational issues are discussed, but when the pressure is on the team spirit dissolves and protection of one's territory is of the utmost importance. Identifying problems in teams is often quite easy but the human nature leads us to defend our actions which hampers the ability to learn.

Because we find the collective inquiry process threatening we fail to find new understanding which often can lead to success but because of this failure leads to decay.

1.4 PROBLEM STATEMENT

The recent history of retrenchments and reorganisation at Howden Air Industries appears to be very much in line with most other organisations who are battling to survive in today's economic climate. The need to change has been acknowledged by most levels but the lack of maturity of its employees from shopfloor to divisional managers is a major cause for concern. The lack of maturity has become evident in the way the management team has created a power struggle by always passing the buck and not collectively accepting responsibility for the poor performance of the company. From a shopfloor perspective the only thing that matters is the amount of money that can be earned. The needs of both the company and the customer are secondary to their personal needs. This has also created a division on the shopfloor as the more militant unionists are in constant conflict with the pro-company employees. Supervisors are given titles but do not have the ability to act appropriately. They are 'buddies' to their sub-ordinates and not someone who leads by example. Senior management at executive level have adopted the policy of decentralising power but certain members of the local management are reluctant to pursue the project as they fear a loss of power will jeopardise their positions.This fear is clearly demonstrated by the lack of actions on the part of the management team. Openly they advocate the concept ofteamwork and participative management, but behind the scenes the autocratic style surfaces by disregarding the input from sub-ordinates and implementing decisions without genuine consultation. Often statements are made against democracy and the subtle attack on the unions by buying over the shop-stewards has further showed the threats which are being encounted by management as being real. A typical example is the promotion of the chairman of the unions to a supervisor whose union activities then took a back seat due to personal promises made by management. When these promises did not materialise the union activities re-surfaced. The lack of discipline, viz hibitual late-coming, absenteeism and poor performance were over-looked as this was seen as creating conflict between the unions and management. Because of the militancy on the part of the unions, management often backed-off as any form of confrontation could expose their weakness in not being able to manage the workforce effectively.

The internal markets model as discussed has as its cornerstone the principles of decentralising power within organisations. It focuses on providing leadership to enhance a collaborative strategy where cross-functional teamwork replaces individualism and the top down approach which exists within the company at present, this however is in some way or another in conflict with those who view this process as threatening to their own positions.

From a management perspective they fear a loss of power, the unions see it as a move to weaken their power base and the shopfloor, whose lack of education is a major weakness to its success views it as a means to enrich themselves.

The absence of the learning organisation as described by Peter Senge is a major weakness which would have to be overcome if the process of change is to be successful. Although the problem may not be unique to Howden the complexity of this situation is aggravated by the conflict in philosophy and practice. The changing business world and the mobilisation of the workforce by unions has further justified the need for developing a process of inquiry in re-solving the many complex problems which we are being faced with. Individualism is far to rife and the personal interest of many employees including management is evidence of the need to re-evaluate the state of the company if long-term sustainability is to be ensured. The past experiences have proven that the 'old ways' of managing is no longer working, this has been proven by many attempts at changing the state of the company without any success. The need to re-evaluate our management techniques has become imperative to the success of Howden Air. A framework of Inquiry has to be developed which will assist us in handling the complexity of managing the process of change both on an individual as well as an organ-isational level.

1.5 CONCLUSION

I have concluded the description of the problem situation at Howden Air Industries as well as the description of the Internal Markets Model and The Learning Organisation. Some concerns which form the basis of the research are:

- Are we ready to embark on the implementation phase at Howden Air Industries?
- How are we going to overcome our learning disability?
- Can long term sustainability be achieved?

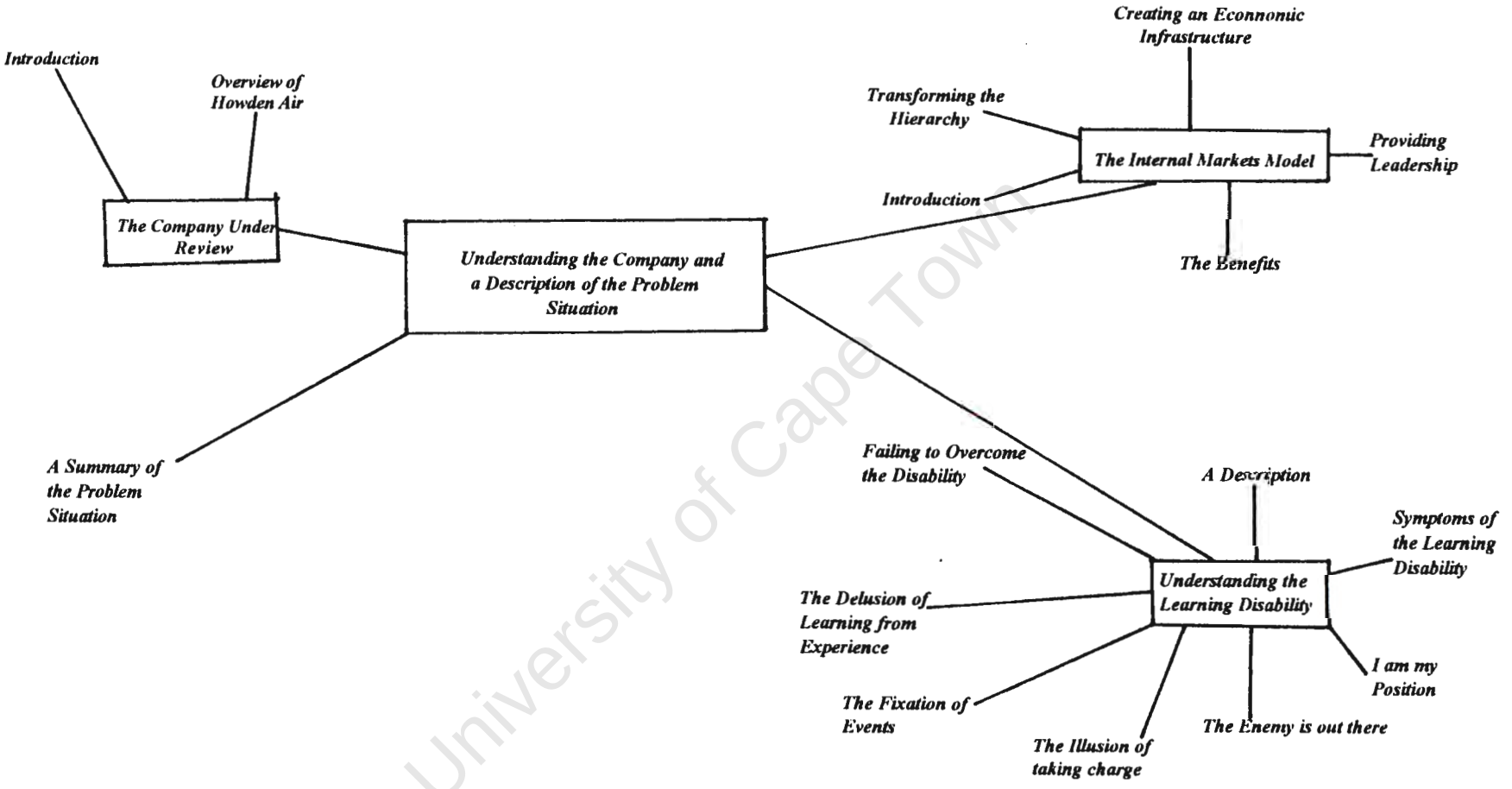


Fig. 1 A Overview of the Problem Situation

PART 2

CHAPTER 2

THE DEVELOPMENT OF A FRAMEWORK FOR MANAGEMENT INQUIRY

2. THE PHILOSOPHY BEHIND THE MODEL

Introduction

Chapter 2 introduces the reader to the philosophy behind the framework for inquiry which includes the development of a learning model for management inquiry. Chapter 3 develops the methods of the learning cycles and includes the works of Peirce covering the scientific method, the management method as described by Revans, the learning cycles of Mumford and Handy and the SCQARE model developed by Prof. Ryan. Also included in the model as further development is the Soft Systems Methodology model used as a tool for investigating problem situations.

Chapter 4 shows the relevance of system thinking and multiple perspectives in developing the framework and introduces the soft systems methodology of Peter Checkland, which is concluded with a developed model incorporating all of the above work.

The purpose of the section is to show the development of the model and the significance of it's application in management practices. The model is then used by applying it to the situation at Howden Air Industries.

2.1 THE PHILOSOPHY AND METHODS BEHIND THE MODEL

Hierarchical Diagrammatic Representation of the concepts **Fig. 2**

This diagram is a representation of the structure to be used in the development of this report. On the top of the pyramid is the philosophical level , which reflects our basic beliefs about the world. Next is, the methodology level , which provides guidelines about how the research was conducted and at the bottom is the technical level, which specifies actions and techniques which should ideally be adopted in carrying out research.

The support for identifying pragmatism as an appropriate philosophy of the Scientific Method offers the philosophical base for the inclusion of Systems Thinking and its methods into the method of inquiry.

A brief description of the management research philosophy together with pragmatism and the philosophy of Peirce is discussed to show the development of the philosophical foundation.

2.2 MANAGEMENT RESEARCH PHILOSOPHY

Introduction

Managers are in some way faced with uncertainties and need to determine actions to create order of chaos.

Management research is the process of understanding management complexities and an aid for managers on how to do their jobs best. I will focus on two methods of research, viz. quantitative and qualitative.

In modern management the focus is more on multi-disciplinary activities, hence the need for managers to be capable of working across technical, cultural and functional boundaries. They need to draw on knowledge developed by other disciplines such as sociology, economics, statistics and mathematics.

Research in management is stimulated by the desire to improve present conditions, therefore it will invariably lead to practical consequences. As a result it would be essential to include ways of implementing findings of the research topic.

Successful research would depend on clear objectives being laid out at the start. These would include:

- A statement on the focus of research and the main questions to be investigated.
- An explanation on how it relates to, builds on or differs from previous work in the field.
- A description of how and what data will be collected.
- An explanation of the data and how it relates to the questions posed.
- Comments on the practical value of the research.

Understanding philosophical issues can be useful in research. It will assist the researcher to:

- Clarify research designs.
- Identify designs that will work.
- Create designs outside of his past experience (Smith Thorpe & Lowe 1991 : 20)

A clearly developed philosophy is needed to evaluate a whole array of interventions which will be determined through this research.

Many philosophies exist with two very apparent corners, viz. Phenomenology and Positivism. In the management field, a combination of these methods have been used by adopting a practical view to research.

One view is that there can be no real knowledge but that which is based on observed facts. This statement contains two assumptions:

- Reality is external and objective.
- Knowledge is only significant if based on observation of this external reality.

The development of the Framework for Management Inquiry has been based on the philosophy of C.S. Peirce who argues the use of his Scientific Method of Inquiry as an important tool to reaching logical conclusions to complex problems. Peirce who formulated the concept of pragmatism described it as the theory of meaning or the meaning of signs. The sign is a form of communication which could take the form of behaviour.

To put this in perspective a description of pragmatism and Peirces philosophy is discussed and used as a basis for developing the model for management inquiry as used in this report.

2.3 PRAGMATISM

The principal contribution to American philosophy in the 19th century was pragmatism, first formulated by Charles Sanders Peirce. William James extended pragmatism to include a theory of truth: a proposition is true if it fullfils its purpose. John Dewey was the leading 20th-century exponent of pragmatism.

The pragmatist viewpoint is to search out new ideas and take the first opportunity to experiment with application and respond to problems as a challenge. The focus of Peirce's work on pragmatism were directed to a more thorough understanding of the thought process. The process of thought is stimulated by the need to produce an action , which gives rise to another thought process. In essence the process of inquiry is believed to be open ended.

The American philosopher and psychologist William James was a leader in the movement known as pragmatism, which stresses that the value of any idea or policy is based entirely on its usefulness and workability.

In 1884 he published the "James-Lange theory". It set forth James's belief that emotions are organic sensations aroused by bodily expression that we feel sorry because we cry, and angry because we strike. William James's most important work, 'The Principles of Psychology', was published in 1890. In this book, James advocated the new psychology that acknowledged a kinship with science as well as with philosophy.

In 'Pragmatism', he expounded the theory that man knows the true meaning of an idea only when he sees what its effects are.

One of the most notable American philosophers of the 20th century John Dewey shares with William James and Charles Sanders Peirce the distinction of founding the movement called pragmatism.

Dewey and his wife started the Laboratory School at the University of Chicago to test his educational theories. Learning by doing was the heart of his method. The children were given freedom to learn in accordance with their needs and experiences. The faculty was able to study child behaviour, a new area of study at the time.

Dewey's pragmatic theories insisted that the way to test ideas was to check them against their consequences rather than to claim their agreement with supposedly self-evident truth. When faced with a problem, said Dewey, a person must logically examine the options open to him to find the best solution supported by the facts. This method of inquiry and testing should be applied to moral and social questions, as well as to technological and scientific ones.

2.4 C.S. PEIRCE AND HIS PHILOSOPHY

Peirce describes science as a living thing continually growing and developing. He saw science as a pursuit of scientific men who he considered as a peculiar class of man. He believed that for men of science achievement was not the primary consideration. What he did consider primary was the spirit that guided the work.

He considered the definition of the scientific man to be someone who was working in the right way to learn something not already known. If someone was not using the correct and effective method he could not be considered a scientific man. It was of no importance in this definition as to how informed the individual is, rather to the fact that correct and effective methods are being used to inquiry. Behind these correct methods would reside the spirit that would not rest with existing opinions but would press on to the real truth of nature.

2.4.2 From doubt to belief

Peirce maintains that both the question asked by the scientist and the answers proposed by them are theoretical. Meaning they are concerned with the real truth of things.

He views the questions raised as doubt and the answers as belief which forms the start and the end of scientific investigation or inquiry. Peirce believes that the doubt in ones mind

stimulates the need for the inquirer to learn the truth through the scientific method and change to a state of belief or a settlement of opinion.

Peirce takes issue with the Cartesian view that one can doubt at will, rather that experience is necessary to give rise to doubt. His concern regarding idle doubt leading to farce is carried through in his attitude toward observation which he describes as not a vacant and passive act, rather a voluntary and attentive experience, often with great effort. The concept of the surprising event that leads to scientific inquiry is clarified by Peirce "*mere irregularity, where no regularity is expected, creates no surprise nor excites any curiosity*" and "*Certain experiences build up habits of expectation in the observer, and when this habit is broken in upon by some unexpected event, the mind changes from belief to doubt, and should undertake a process of inquiry to explain the unexpected fact*" (Reilly, 1990 : 30).

The chief stages of the method are: observation, abduction and verification. This is discussed in more detail further in the report.

2.4.2 Peirce on fixing belief

Peirce defines the process from doubt to belief as the desideratum of the human mind. In order to define the most effective method for realising this process, he articulated three approaches for fixing belief as alternatives to the scientific method.

The three methods are Tenacity, Authority and A Priori. Peirce argues that these methods do not offer a long term sustainability of the fixed belief.

2.4.3 Tenacity

Also named the "Ostrich syndrome", this method implies the holding onto beliefs purely because it is the most comfortable alternative, when we are taken out of our comfort zone we tend to avoid the change in the environment by burying our head in the sand . It can possibly be likened to a selective ignorance, which is practised to protect an existing belief.

Peirce reasons that one cannot ignore the environment for a sustained period unless leading a reclusive lifestyle. Man is a social creature and is influenced by other people's opinions. It can therefore only offer short term security to the person employing this method.

In Peirce's words :

"The man who adopts it will find that other men think differently from him, and it will be apt to occur to him, in some saner moment, that their opinions are quite as good as his own, and this will shake his confidence in his belief" (Peirce 1877).

2.4.4 Authority

Directly relevant to this method is the concept of control. More specifically, control over the beliefs of individuals by groups of individuals using coercive means.

Naom Chomsky expressed the Western civilisation's efforts to fix belief by method of authority, "The manufacture of consent", which is a sophisticated manipulation of the media in order to maintain a specific level of ignorance in the individual. This suppresses the tendency to think of alternatives to the belief held by the controlling authority. A challenge of this belief by a daring individual may be discouraged by the prospect of uncomfortable consequences. Although this approach is still popular when dealing with the governing of countries, the organisation or business may often include many individuals who are above external control, and who are prepared to challenge authority. Peirce argues that no state can regulate the opinion of every subject, which reduces the long-term viability of this method.

2.4.5 A priori

According to Peirce, the a priori is a more respectable method of fixing belief than the method of authority. Both methods employ coercion, however, the a priori follows a more intellectual path.

A group of intellectuals democratically decide which propositions are acceptable against a set of criteria. Coercion is practised by using esoteric language and intellect to attack those who oppose their propositions.

The basis for the selection of the beliefs is not observed facts, according to Peirce, but rather by the degree by which these propositions support reason.

He states that this method is more acceptable than the other two, by virtue of its more beneficial nature. However, the lack of including observed facts in the determination of beliefs may be interpreted as a lack of a base more stable than the perceived reason of intellectuals. This hampers the potential of this method to support sustainable beliefs.

The three categories may be explained as follows: firstness and secondness are determinate as reactions by the inquirer, with thirdness the indeterminate component, addressing the future and requiring a proactive stance.

2.4.6 The Scientific Method (Peirce)

It is the scientific method that Peirce suggests is the only method for the discovery of a true nature of the external world and therefore of fixing belief. The chief stages of Peirce's method are: observation, abduction and verification. These are discussed in more detail in Part 3.3.

CHAPTER 3

3. THE LEARNING CYCLE

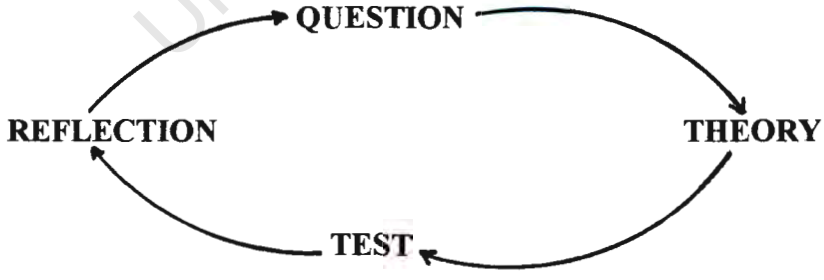
3.1 AN INTRODUCTION

As a result of experience with life and in particular in education and work environments, most people make similar assumptions about the nature of the learning process. Because those assumptions are seldom explicit many opportunities for learning are missed. Learners are not taught, they are motivated to seek new knowledge , skills , and behaviours. It is a process filled with tension and conflict which is sometimes painful since it involve adapting to new ways of believing, thinking, and acting which are discovered through the learning process. This chapter shows the development of the model of inquiry by introducing the reader to the various cycles used in the synthesis of the model which is presented as a conclusion to this chapter.

3.1.1 The wheel of learning. (Charles Handy)

The process is started by raising a question in a particular situation. An answer is given and tested by implementation. The process is concluded by reviewing the test against the original question. The learning process can be viewed as a cycle of activities which is stimulated by the need to gain knowledge about a situation.

- Learning is a cycle of different activities
- Learning should be a process of discovery
- Learning is about answering a question or solving a problem.



The learning wheel: Fig. 3

1. Question is raised in a particular situation
2. An answer is given (theory)
3. Test theory by implementing (reality test)
4. Reflect again by reviewing against question

3.1.2 Lubricants of change

Starting the wheel of learning is as difficult as keeping it moving. Fortunately there are lubricants to keep it going and keep the learning process in motion. There are three fundamental lubricants which we will consider.

- A proper selfishness
- Re- framing
- Negative capability (Handy 1990 : 51)

Those who learn best are those who take responsibility for their actions , have a clear view of what they doing and believe they can achieve what they want the future to be.

Re - framing is the ability of the researcher to see things in a different ways , to look at problems sideways or upside-down . To put them in another perspective or another context, to think of them of opportunities and not as a problem.

Negative capability means looking at the negatives and converting it to positives. It is important to note that the unknown is never completely known. Making mistakes is part of the learning process, if the mistakes are analysed and prevented from recurring.

The complexity of management inquiry and the difficulties facing management practices requires a far more rigorous approach to investigating complex issues. The learning cycle as described by Handy is much to simplistic in describing a viable scientific methodology for management research, hence the need for further development was required. The answer to a question is given and tested by implementation. This process implies that the answer which is given to be the correct solution and does not allow for rethinking. If we looked at business today we would soon realise that many issues facing management today are far to complex and require far more input than suggested by the learning wheel. It does not provide for evaluation of alternatives prior to implementation. Personally I view the wheel as a quick fix method of inquiry as it would provide short-term solutions with a strong possibility of the problem not being resolved for any meaningfull length of time. For this reason the work of Revans and Peirce are used as a means of enhancing the suitability of the model to be used by further investigating the relevance of the scientific methods of inquiry and the model of inquiry.

3.2 MANAGEMENT AND THE SCIENTIFIC METHOD (REVANS)

Revans (1982) explains that there exists a parallel process between the scientific method and good management practice.

•The scientific method consists of five iterative steps:

•Observations from the external world

•The formulation of a theory based on these observations

•The design and conduct of experiments to test the theory

•Comparison of the experimental results with those predicted by the theory

•The rejection, modification or confirmation of the theory in accordance with the results of the comparison.

The scientific method is a process of constant verification what is being done against a forecast of what it is planned to do. This process is set in motion by human beings to fulfil a specific need. He argues that rigorous adherence to this method has allowed science to progress as it forms a self-correcting loop. He also argues that this method can be used in industrial administration, simply by substituting a technological product for a scientific theory (or, indeed, a management theory). This appears as follows:

•Determination of what needs exist and what artefacts have already been produced to satisfy these needs (Survey)

•Decisions about what further or different artefacts to produce (Policy)

•The establishment of methods of manufacture (Operations)

•Processes of audit (Inspection)

•Changes in what artefacts should be produced or in the methods of production (Control) (Revans 1996 : 99)

The managerial process thus sets out to test how far the results of its planned actions compare with those forecast by its policy. Inside each step, a similar fivefold structure can also be used.

Management unlike the scientific process seeks to fulfil subjective desired aims and values, these should be clear and unambiguous from the outset. A declaration of preferred aims should formulated from the beginning and this can be used for comparison with the actual results achieved by the actions taken. Revans acknowledges that the result can only be statistically significant as such situations contain many variables, only if deviations are persistent then the theory should be discarded or modified. Also, the high standard of record keeping and statistical knowledge that have made the sciences so powerful, should be applied to the management situation. Finally, the cost of the improvement must not exceed the intended gain.

The scientific method is an iterative self-correcting cycle and is similar to the learning cycles described in the previous section. Figure 4 shows the synthesis of Revan's scientific method, management method and Handy's learning cycle.

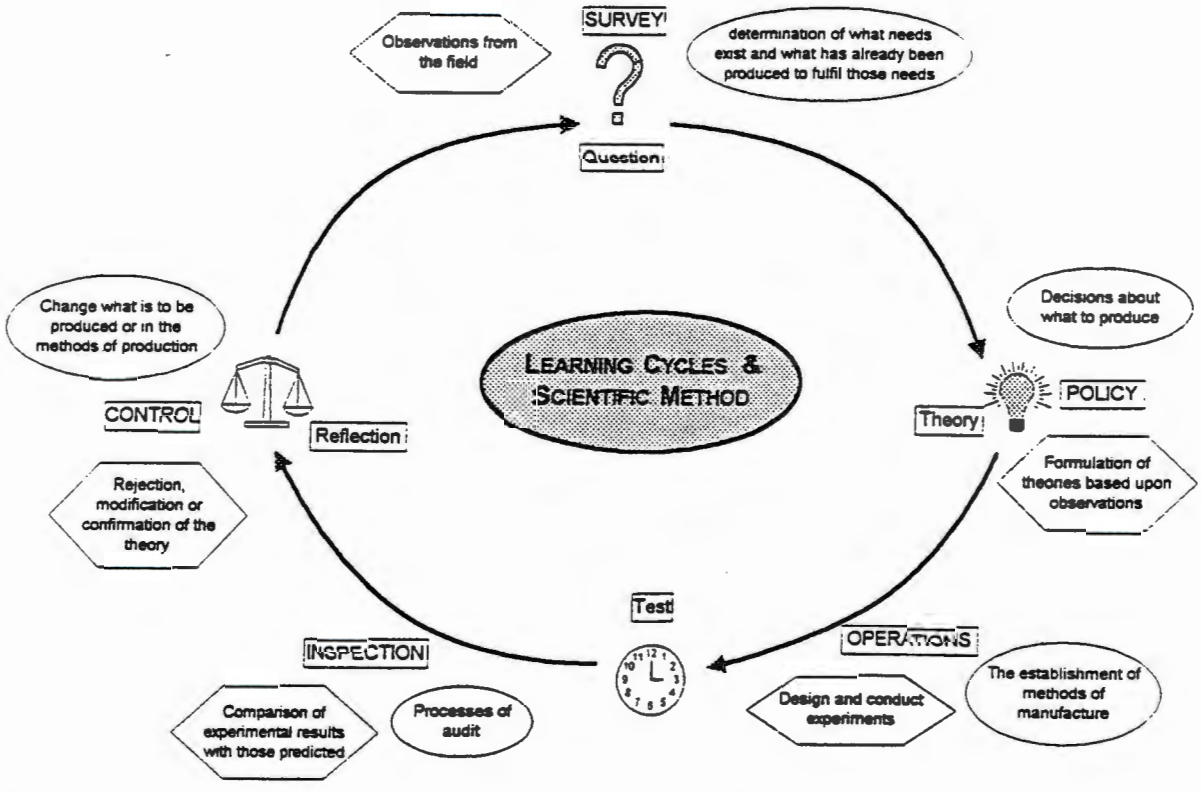


Figure 4: Diagram of Management and the Scientific Method in a Learning Cycle

3.3 SCIENTIFIC METHOD ACCORDING TO CHARLES PEIRCE

3.3.1 Introduction

Like philosophy, science emphasises the use of logic. In fact, science can be viewed as a scrutinising system of logic. It seeks to answer questions by observing phenomena. The scientific method is the system of logic used by scientists, though some sciences differ in their use of logic. As scientists try to solve a problem, they may use a model based on a logical, plausible connection of events. Like a hypothesis, the model is then tested by making predictions based on the model. If the predictions are proven wrong, then the model is revised. If the model survives the tests, the model becomes the system of logic that describes the theory (Reilly 1970).

Unlike philosophy, science emphasises the repeatability of results. This means that a given set of circumstances should always produce the same result. Scientific theories are not

accepted by the scientific community until the theory has been validated. One way to validate a theory is to have scientists in other laboratories duplicate the experiment or the calculations. Using another set of materials and methods, these scientists may repeat the experiment and check the accuracy of the previous report. This long and careful process will confirm that the original result was not merely a fluke occurrence, a misinterpretation of events, or an error in procedure.

By having several scientists investigate a situation, the most accurate description of cause and effect can be determined. Many of the most basic questions in science can be phrased in the form: "How does. . ?", "Why does. . ?", and "What determines. . ?". These are all attempts to establish cause and effect. A difficulty arises when many factors, or variables, affect the system at one time. In one type of laboratory test all the variables but one are controlled. The uncontrolled variable is known as the experimental variable, and the others are the control variables. This method of testing is called controlled experimentation.

3.3.2 The Scientific Method

Peirce leans on the scientific method to explain the process of Abduction, Deduction and Induction. In following Peirce's method of inquiry the inquirer will look to nature for an answer to his questions. The answer can be expected to be found through his observation of nature.

Coupled with his experience with nature is the experience of the researchers past. Peirce claims that the mind has already developed and has definite questions which it wants nature to answer. It is further claimed that the progress of science depends on the observation of the right facts by an inquirer with appropriate ideas. The chief stages of Peirce's method are: Observation : Abduction and Verification. These are described below.

The Abductive Phase

Peirce uses the term abduction to designate the activity by which an hypothesis is formed. (Scruton 1994 : 19). An hypothesis involves a reduction of many predicates into one or fewer than before, this he considers a vital function of science.. Peirce commits strongly to his belief that experience coupled with human intellectual invention and intuition, stimulated by doubt and observation, produces the explanatory hypothesis. Peirce's argument that experience is our only teacher is coupled with his belief that the human mind has the power for original thought.

The hypothesis involves reasoning from effect to cause, it is the process of amplifying our knowledge through a plausible explanation. The process is stimulated by finding relationships which are not obvious at the observation stage.

Abduction is a process which concludes with a case , inferred from a known rule and a known result. An hypothesis is not meant to be perfect , it merely proposes a likely explanation of experience.

Any explanatory hypothesis must contain the following criteria:

- The observed facts are necessary or highly probable.
- Deal with facts which differ to what is to be explained.
- Facts must be verifiable.

It must take account of practical and economic issues surrounding the verification.

An example of abductive reasoning is as follows.

Result	:	Productivity has dropped.
Rule	:	Productivity often drops when morale is low.
Case	:	Check to see whether morale is low.

The Deductive Phase

After a hypothesis has been chosen predictions as to the results of experimentation are deduced. This phase is not an examination of the phenomena rather it is an examination of the hypothesis. Its main function is to prove the hypothesis. The predicted results must be observable, the truth therefore is reached not by reasoning but by experience. The deductive step must produce observable predictions from the hypothesis.

The deductive phase presents a line of reasoning that leads to a therefore conclusion, and the point above is a summary of that line of reasoning. It states the implication of two situations existing in the world at the same time. This process of scientific inquiry must terminate with genuine predictions of the if - would variety. This means that at this stage the results of the testing must be unknown or virtually unknown.

An example of a deductive process is as follows:

Rule	:	Low morale leads to low productivity.
Case	:	Morale is low.
Result	:	We can expect low productivity.

The Inductive Phase

Induction is the process used by the scientist, to investigate to see where the predicted observable consequences of the hypothesis actually occur. Whether the results confirm or deny the hypothesis, science has been advanced. During this phase the inquirer must ensure that fair sampling is adhered to. The inquirer judges the hypothesis and from this evaluation he proceeds to adopt , modify , or reject the hypothesis. In essence according to Peirce the induction phase is the experimental testing of the theory.

The inductive phase consists of three parts , viz. :

- classification
- probation
- sentential

Classification is the result of the prediction of the sort of thing to be expected if the hypothesis is true. Probation describes the quantitative and qualitative evaluation of results. The Sential or third part of the inductive phase is an appraisal of the probation's, and judgement of the whole result, so that the explanatory hypothesis may be regarded as proved, partially proved, unworthy of further investigation, in need of further modification, etc.

This process leads to the convergence of the truth, in that persistent use of the inductive method will gradually reduce the incidence of error. In conclusion Peirce asserts that the Induction process rest not only on the facts observed , but in the manner in which these facts have been collected.

An inductive argument is as follows.

Case	:	Morale is low.
Result	:	Productivity has dropped.
Rule	:	Productivity could have dropped because morale is low.

3.3.3 The systems view and the method of science.

Science is a way of acquiring publicly testable knowledge of the world, it is characterised by the application of rational thinking to experience , such as is derived from observations and from deliberately designed experiments , the aim being the concise expression of the laws which govern the regularities of the universe , these laws being expressed mathematically if possible (Rosenhead 1989 : 50).

Scientific work has three main characteristics , Viz.:

- Reductionism

•Repeatability

•Refutation

•Repeatable Experiment

It is important to realise what it is that has to be accepted': it is the happenings in the experiment, and it is only that (Rosenhead, 1989 : 53).

The opinions or theory may be disputed. If the experiment can be repeated by disinterested people and the experimental happenings checked and found to concur then the experiment is 'scientific'. This gives science its solid core and excludes opinion, preference or speculation from this base.

•Refutation

When a hypothesis is tested it should be tested to destruction, we should be more interested in refutation than corroboration. This stems from the fact that you can not prove anything by induction. Proving a hypothesis is the reserve of the deductive argument. The experimentalism should therefore set the most severe test he can think of.

•Systems Thinking and Science

There can be no doubt that the scientific method of the past three hundred years has resulted in gigantic and exponential development in the physical world. The limitations of scientific methods have become more apparent in the last fifty years as the disasters from unbridled scientific development based on the reductionism paradigm of Descartes became apparent.

•Descartes' second rule

'divide up the problems being examined into separate parts - the principle most central to scientific practice - assumes that the division will not distort the phenomenon being studied' (Rosenhead 1989 : 59)

Although these reasonable assumptions that this method of study would result in repeatable experimentation and a understanding of the whole, it has become apparent that in complex situations where there are dense connections between the parts, such as in the problems investigated by the social sciences this method fails to yield satisfactory results.

Comte's ordered the natural sciences into; mathematics, astronomy, physics, chemistry, the biological sciences and finally sociology, and he believed that the sequence represented that each science was more complex than the one before it with their own irreducible laws.

Comte argued that all science had passed through or was passing through one of three phases; a theological phase, dominated by fetishist and beliefs and totemic religions; a metaphysical phase in which supernatural causes are replaced 'forces', 'qualities', 'properties',

and finally a positive phase in which the concern is to discover the universal laws governing phenomena, leading to as near a certainty as man can hope to attain (Rosenhead 1989).

As this work is a description and explanation of a model for inquiry into management or operational issues and therefore an attempt at a model that incorporates scientific methods with systems thinking it is relevant to focus on some of the problems surrounding the study of social systems.

Comte places sociology at the apex of the pyramid of the sciences. It appears that the relative youngness of the science and its complexity have yielded little substantive development of explanations of social phenomena. Even though social science is complex with much connection between the parts, the problem of this science lies on a more fundamental level; that of methods, this is elaborated by Ernest Nagel

'...in no are of social inquiry has a body of general laws been established, comparable with outstanding theories in the natural sciences in the scope of explanatory power or in capacity to yield precise and reliable predictions...many social scientists are of the opinion, moreover, that the time is not yet ripe even for theories designed to explain systematically only quite limited ranges of social phenomena...social scientists continue to be divided on central issues on the logic of social inquiry...The important task, surely, is to achieve some clarity in the fundamental methodological issues and the structure of explanations in the social sciences (Rosenhead, 1989 : 67).

It is the contention of the model that the results yielded from the reductionist view is partly responsible for the lack of progress. It is for this reason that systems thinking and the current tools of systems thinking such as ; soft systems methodology, systems dynamic modelling and viable systems modelling, when added to the scientific method of inquiry can yield far richer results than those achieved by the Cartesian view.

System thinking is an attempt, within the broad sweep of science, to retain much of that tradition but to supplement it by tackling the problem of irreducible complexity via a form of thinking based on wholes and their properties which complements reductionism (Rosenhead 1989 : 74).

Some form of method has to take into account the influence of a commonly held worldview on individual and group perceptions and how this is manifest in the description of events by these individuals. The method needs to provide for verification by observation of the actual phenomenon. Tools such as Soft Systems Methodology provide a method of inductive reasoning to achieve this (Checkland & Schole: 1990).

The scientists investigation into human behaviour has to include the viewpoint of the actors themselves, the participants explanation of the situation, and consider this against the description of the results of observation of actual happenings by natural scientists.

It is systems thinking that allows for these different perceptions and worldviews to be swept in to obtain a far richer picture of the situation. Even though this may not be complete.

'In the language of systems, social influences are never fully separable from all the other parts of an Inquiry System. Further, it is not clear that it should be...our goal instead should be to understand how such biases operate' (Smith, Thorpe, Lowe 1991 : 35).

and

'One should therefore try to understand and explain why people have different experiences, rather than search for external causes and fundamental laws to explain their behaviour. Human action arises from the sense that people make of different situations, rather than as a direct response from external stimuli (Smith, Thorpe, Lowe 1991 : 25).

3.4 A DESCRIPTION OF THE SCQARE MODEL

The development of the framework has primarily covered the learning cycles including the works of Handy, Peirce and Revans. Thus far the research has focused on the scientific methods as a tool for handling complexity and resolving managerial problems.

In his presentation, conceptualising and articulating your ideas Prof. Ryan further develops the SCQARE framework which offers a rigorous approach in a viable manner. As I have found this framework to be useful on its own is analysing case studies and writing of reports I have included it in the development of the Model of Inquiry which is used in this thesis. A description of the SCQARE follows.

Situation

Here you introduce the reader to the topic being researched or presented, it tells the reader something which he already knows about the topic. The purpose of presenting the situation in this manner is to grip the attention of the reader and push aside his other thoughts. This is merely a way that will make it easier for him to concentrate on what you're trying to say.

Concern

The concern is raised in the description of the situation by identifying an alteration to a stable situation. This could be described in many forms: viz.

- something went wrong
- something changed

•here's a different view

•here's what you might expect (Minto: 1982:37).

Question

Coming out of the concern certain questions will be raised in the mind of the reader which will be answered in the document. Typical questions in response to the above concerns could be:

•what do we do?

•what should we do?

•who's view is right?

•how do we find it?

Answer

In management the general principle is that there is no right or wrong answer. Solutions could be very effective or less effective. This method of presentation would normally give the reader a number of answers which could be used to resolve the concerns raised. When generating the answer it must always take into account the following:

1.The details of the system

2.The nature of the concerns

3.The needs, perceptions and beliefs of the stakeholders (Ryan : 1996).

Reasoning

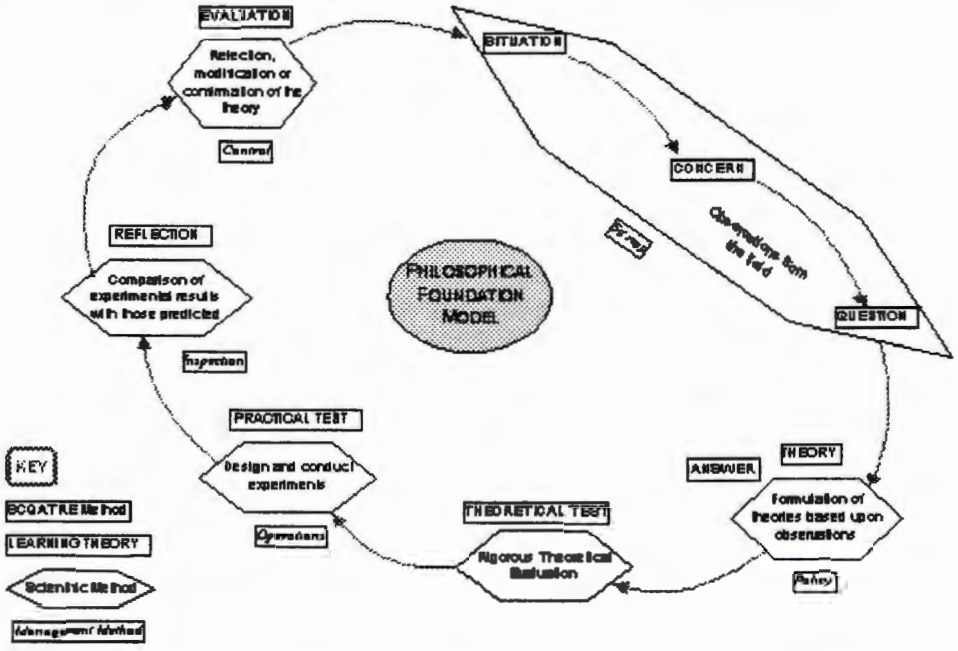
Here the writer puts forward a point of view influenced by his interpretation of the evidence and theoretical assumptions relevant to the situation. The level of understanding of the situation and concerns will reveal the relevant information needed.

Evaluation

The most effective way of evaluating the solution would be to test them against your past experience or that of others.

To date I have covered both the philosophy as well as the methods used in the development of the Model of Inquiry. The introduction to the synthesised model will show the complexity with which management practices must be handled. A description of the model is given here;

3.5 THE MODEL OF INQUIRY FOR MANAGEMENT PRACTICES



Diagrammatic Representation of the Model **Fig. 5**

The model is a synthesis of the works of :

Charles Handy	Question	Answer - Test - Reflection
Mumford	Experiencing	Reviewing - Concluding - Planning
Revans	Experience	Reflection - Experiment - Reflection - Action
Charles Saunders Peirce	Scientific Method of Inquiry	
Professor T. Ryan	Scqare	(UCT Lecture 1996)

3.5.1 Description of the Model

The complexity of the model is evidence of the belief that simple learning wheels as described by Handy , Mumford and Senge amongst others are inadequate to handle the complexities of the learning organisation.

Charles Handy used the learning wheel to describe his process of learning. He claimed that the process is stimulated by doubt in the mind of the inquirer who raises a question about a particular situation he find himself in.

Revans claims that managers are faced with difficult decisions that needs to be taken on a daily basis. He believes that there exist a strong parallel between this decision making process and the scientific method of inquiry.

Peirce , who advocated the method of scientific inquiry claims that the inquirer who follows this method will look to nature for answers to his questions which were raised by some

doubt which the inquirer had about the situation. He believes that the answers to the questions can be found by observing the facts of nature.

Professor Ryan in his SCQARE presentation suggests that this method allows one to inquire into a situation which the inquirer wishes to investigate. It is the process which answers a question that was raised through a concern which exist within the situation.

The integration of the various models discussed above shows the interconnectedness which has been used to develop this model. The process of learning is considered to be an open-ended process of discovery where the conclusion is defined by the inquirer himself. It requires the building of models which the inquirer believes to be appropriate to the situation he is investigating.

Having answered the question which was raised the inquirer now proceeds to draw an hypothesis which explains the possible outcome of the observed situation. According to Peirce's scientific method of inquiry this is the conclusion of the abductive phase. Following this phase is the deductive phase which is the process of examining the explanatory hypothesis (theory). Its main function is to either prove or disprove the hypothesis depending on the view of the investigator. In the application to the model this process would include the Theory, and both the theoretical and practical test. To complete the learning cycle a process of induction is used. This is the process where the observer investigates to see if the predicted outcome of the hypothesis actually occurs. This would include the practical test , the reflective stage and the evaluation of the process.

Most learning in complex situations would require the cycle to be repeated if any meaningful conclusions are to be reached.

A simple description can be seen using the following example.

Situation

Productivity in South Africa is fast declining due to a lack of effort on the part of management to reverse the situation in general.

Concern

If productivity is not measured and improved the S.A. economy will suffer.

Question

What alternatives are available to management to address the question of increasing productivity.

Theory Plan of Action (HYPOTHESIS)

Attitudes and correction of management practices can put us back where we belong, Equal to anyone in productivity.

Test

Productivity is a practice to increase market share and give organisations a competitive advantage. Observe trends in the workplace to gain insight into present productivity levels.

Practical test\implementation

Productivity measures must be installed to monitor trends.

Reflection

Is productivity showing any trends that will improve the situation. If not repeat the cycle by modifying the hypothesis and reviewing the test phase of the model.

3.6 Summary

The practical application of the scientific method must be understood in the context of this work in that situations investigated by management are often of a 'social system' design nature. This means that as they are being investigated they are changing and before a plan to influence the problem can be introduced, they are likely to have changed further. The situations are not static. The management practitioner will never have all the facts, but by applying the method in a practical way he can develop sufficient understanding for action (Revans : 1996).

For this very reason the inclusion of system thinking will help us to build more comprehensive understanding of organisational systems. This section is followed by a description of System Thinking and it's relevance in this work.

CHAPTER 4

THE INCLUSION OF SYSTEM THINKING AND IT'S METHODS

4. INTRODUCTION

"The need for new thinking is like the weather. Everyone talks about it, but beyond that , no one does much about it. It is precisely the inability of old ideas to meet the challenges of our age that make new thinking more critical than ever. If ours is indeed the "New Knowledge/Information Age", then ideas are obviously at its core. (Mitroff & Linstone : 1993)

Systems thinking has introduced us to a new way of thinking where synthesis of the problem has replaced the machine age and analysis. Embedded as a core principle is the differing world views which affects the problem situation under review. Management practices have become far to complex for individuals to make meaningful decisions in isolation. Interconnectedness and cross-functional decision making is becoming more demanding and if we are to succeed in this field we would have to learn to draw input from the various views held within the organisation. As the development of the model in Chapter 3 describes, the simply learning cycles of Handy and Mumford are to superficial to unravel hidden problems which lies at the root of most problems. The inclusion of multiple perspective is an attempt to present the three perspectives from which complex situations may be viewed. Each of these perspectives provide insights that are not available from the others. Although it is impossible to place a weighting on a perspective to influence the overall view and the 'rightness' of listening more to one perspective than another, the use of all three enriches the overall view and therefore enhances understanding.

The use of Soft Systems Methodology, a learning system which focuses on complex problematical human situations, and lead to taking purposeful action in the situation aimed at improvements adds completeness to the Model of Inquiry (Checkland : 1990). Although I use the word completeness I must emphasise that the process of Inquiry is only complete if defined by the inquirer. This chapter is concluded with a diagrammatic representation of the Model of Inquiry into management practices which incorporate the Soft Systems Methodology.

The basic method of inquiry used in the machine age was analysis which consisted of three steps namely.

- Breakdown the problem into parts
- Understand each part individually

•Aggregate the understanding of the parts into an understanding of the whole.

This approach has received criticism in the past as the management of business has become to complex to simply pull things apart without understanding the effects which impact within a given system.

We have now reached the stage where a strong view is evolving. Complex systems such as business cannot be dealt with effectively using the analytical methods as the interaction between the sub-systems are far to complex. This leads us to the term which was coined as synthesis.

Synthesis is the opposite of analysis and consists of three stages: namely.

•Take the system under consideration and identify the supra-system of which it forms a part

•Identify the purpose and function of the supra-system

• Explain the system in terms of it's role or function within the wide system.

This process is believed to be better as the cause and effect behaviours of the sub-systems ensures that an understanding of the interactions of the parts of the systems will be obtained. This study has lead to the school of Systems Thinking described further on in this document.

4.1 BACKGROUND TO SYSTEM THINKING

Systems Thinking is a method that sees the world as an interconnected whole, rather than a set of different parts. Systems Thinking is traditionally accepted as emerging in the 1940s as a response to the failure of mechanistic thinking (where an aggregate of the parts of a 'system' is equal to the sum of its parts) to explain biological phenomena. However, the American Indians, amongst others, are on record as having expressed similar ideas a century before the modern Systems Thinking was born.

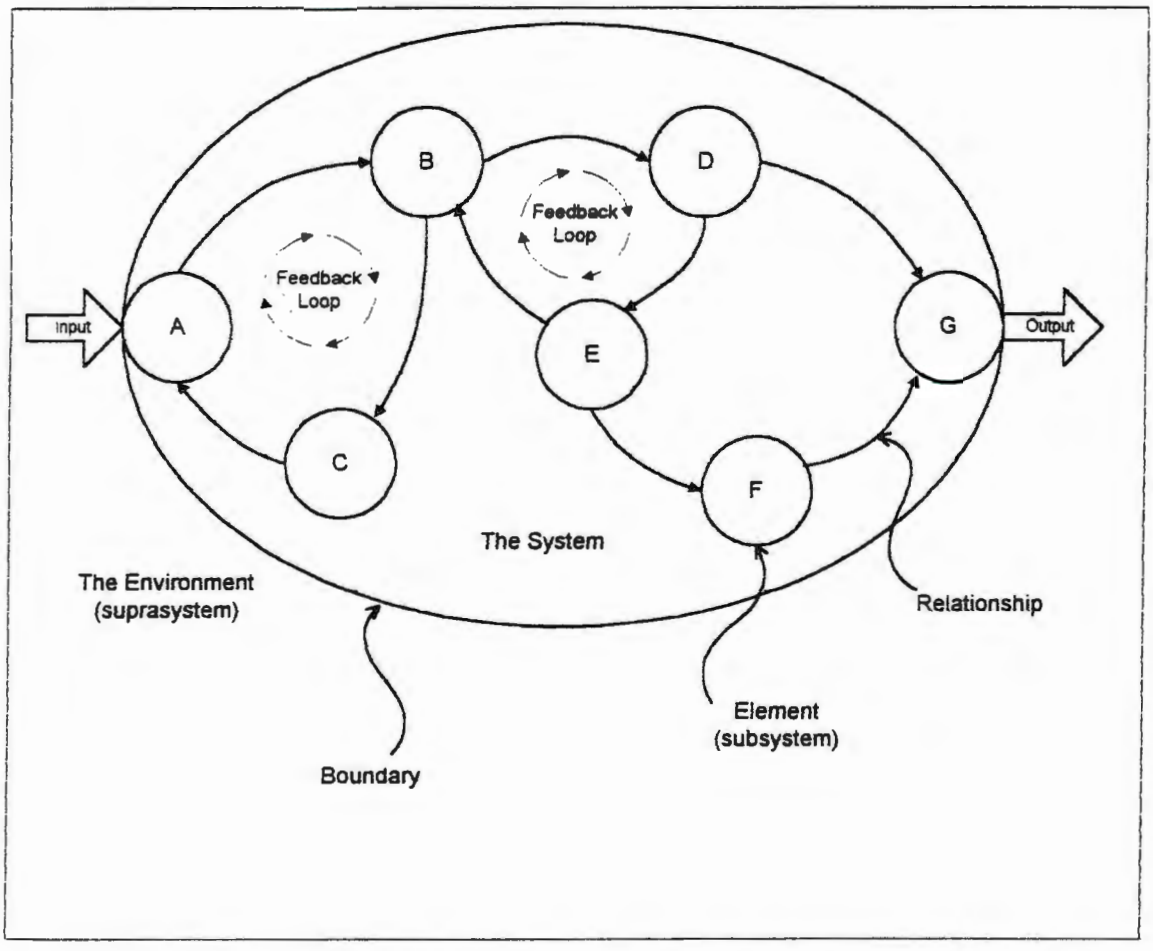
Today, however, the word 'system' has been so overused that it has lost its specific meaning which is intended here. Other names have been suggested, for example, 'holon'. A system or holon is an abstract conceptual model of the real world that is often useful to organise or model our thinking on the real world. Systems Thinking is more powerful at tackling real world complex interconnected problems (or 'messes' in Ackoff's words) than traditional reductionist thinking. This is especially so where often unpredictable human actors are involved.

Basic Concepts

The most basic core idea of Systems Thinking is that the complex whole may have properties which refer to the whole and are meaningless in terms of the parts which make up the whole.

These are its 'emergent properties'. This is expressed in everyday use by the phrase 'The whole is more than the sum of its parts'. The concept of emergent properties itself implies a view of reality as existing in layers in a hierarchy. This means that each 'system' is part of a larger 'suprasystem' and itself contains smaller elements of 'subsystems'. If such a hierarchically organised whole has processes of communication and control which would enable it to adapt in response to changes in its environment, it should in principle be able to survive in that changing environment (Checkland : 1990) and (Clemson : 1984).

A system can be identified by the transformation that it performs and its general purpose. The transformation process should change the nature of the input, this can be a physical or abstract entity. The general way of approaching systems is then to define a system in focus for that transformation. This system will be embedded in an environment or suprasystem and have parts or subsystems contained within it. This defines the boundary of the system. The relationships or interactions between the subsystems can also be identified and studied, especially for feedback loops that are present or lacking. More clarity can be achieved by asking the so-called cybermetician's or systems questions of the system (Clemson : 1984)



The System in Diagrammatic Form (Flood & Jackson: 1991) Fig 5.

4.1.2 Types of Systems

Many have tried to provide a method of systems classification or taxonomy, for example, Boulding who based his systems levels on the level of complexity and Jordan who based his on three principles, namely *rate of change*, *purpose* and *connectivity*. Ackoff provides a useful way of classifying systems based on the purpose (the ability to choose its purpose) of the systems and its parts. In this way he classifies systems as *mechanisms*, *organisms* or *social systems (Ackoff : 1990)*. A mechanism and its parts have no choice of purpose, but rather serve the purposes of the containing system. An organism has choice of purpose, but its parts have no choice of purpose. In a social system the parts also have choice of purpose. This makes a social system the most difficult to manage as the parts may have purposes which are in conflict with the larger system. This can explain the failure of the traditional scientific management of Taylor to deal with modern issues (or 'messes' in Ackoff's words) as it assumes that the parts have no purpose.

4.1.3 Methodologies for Handling Complexity

With Human Activity Systems, often different actors or stakeholders will have fundamentally different perspectives of the system and will define it differently. This complexity can be handled by asking the stakeholders to define the system according to their worldview as in the Soft Systems Methodology approach of Checkland or by addressing their assumptions regarding the other stakeholders as in the Strategic Assumptions Surfacing and Testing approach of Mitroff and Mason. These are both powerful approaches to handling the complexity of social systems.

These and other methodologies are based on the Systems Thinking paradigm and provide and organised way of tackling the messy situations that occur in the real world with their flux of interacting and conflicting events and ideas. The systemic understanding of these situations allows for directed action that can be taken at points of high leverage and make significant improvements in the situation.

4.1.4 The Systems Approach

The systems approach was formed through the philosophical basis developed by Edgar Arthur Singer and C. west Churchman amongst others.

The systems approach sweeps in psychological knowledge about how and why humans perceive the ways that they do and what kinds of errors they typically make so that we may correct them. Failure to do this successfully is a failure to learn effectively. The fundamental principle of Singer's analysis was that there were no simple acts in any science or profession

to which supposedly more complex situations could be reduced. He further suggested that all science depended on each other. This notion of interconnectedness or non-separability forms the basis of what is known as the systems approach. This approach recognised that all human problems are complicated and that their complexity must be recognised if they are to be managed properly.

4.2 MULTIPLE PERSPECTIVES

4.2.1 Inquiry Systems

One cannot act on agreement alone without knowing a great deal about the manner and the conditions under which it was achieved. We have more data and information on every subject, yet less understanding at the same time. For something to count as knowledge, it must be based on facts or observations. What science has done is to refine and extend the methods of attaining agreement. (Mitroff & Linstone 1993 : 21)

Science focuses on primary observations which human observers can agree on. It emphasises the method of reasoning, which from empirical results or predictions, leads to mental models that satisfies the requirements of the known phenomena.

An inquiry system is a system of interrelated components which produces knowledge on a problem or issue of importance (Mitroff & Linstone 1993 : 29). Inquiry Systems has or accepts distinctive inputs from the outside world which are used as the building blocks. These inputs could be raw facts, observations or various judgements of experts. To convert inputs into outputs, the inquiry system requires an operator. The process of the inquiry system has to be concluded by a guarantor (Component guaranteeing the operation of the entire inquiry system itself. The guarantor is the most critical aspect of an Inquiry System, because it influences everything within the inquiry system (Mitroff & Linstone 1993 : 31).

Complex problems are by and large a part of a larger and even more complex problem. To successfully resolve these, one has to make critical decisions as to where and how to draw the boundaries between certain parts of the critical decision and other parts of the relevant surrounding system.

Analytic deductive inquiry systems

The input into an analytic-deductive inquiry system are simple ideas that break complex phenomenon down into its basic components. The operator is typically a mathematical operation which produces a single final output. The guarantor is concerned whether he has selected the inputs correctly and whether it has been applied correctly.

Analytic inquiry systems places extreme emphasis on logical consistency. Logic is regarded as the fundamental guarantor of everything that humans do. Objectivity is reached if the system can clearly show that it followed deductive certainty (logically) from a series of initial propositions. Analytic deductive inquiry systems should typically, but not always, present one model and one model alone of the problem and derive one best outcome from that model. Russell Ackoff in his book 'Creating the corporate future' refers to the human inquiries as 'messes' meaning that every human problem is associated and involved with every other human problem. Thus the inputs into any problem solving requires one to look at the related problems too.

There are certain rules of thumb that are helpful in overcoming the myopia often associated with models:

- Seek the obvious.
- Question all constraints.
- Challenge as many assumptions about the problem and the model as possible.
- Question the scope or definition of a problem or model.
- Question whether a problem is to be solved, resolved or dissolved.
- Question the logic itself (Mitroff & Linstone 1993 : 49).

4.2.1 Complex thinking

Multiple reality

Immanuel Kant's philosophy formed a general background to combine the model part of analyses and the 'data part' of agreement, into an interactive whole. Educated people have realised that both the experience of reality as well as its description are heavily dependent on the structure of our minds. This plays a fundamental role in:

- What we experience as reality
- How we experience it
- What we characterise as reality
- How we characterise it (Mitroff & Linstone 1993 : 58).

For humans to experience or gain knowledge about their external world, something must be built into the internal structure of their minds that is capable of receiving data or facts characteristic of the outside world or presumably reality itself. The multiple realities inquiry system does not allow data, facts or observations to be separated in principle from the theory or the model that we construct of a problem. The data used to construct the model must be compatible for it to be meaningful.

The input of multiple realities inquiry systems are composed of two interrelated parts:

- A data set coupled to a model
- A range of different data model couplings that represents various views of the problem.

Multiple realities do not assume that there is one and only one way to define important problems. It assumes that the analyst needs to see explicitly a range of different representations of the problem so he can participate actively in the problem solving process. Views or multiple perspectives is an explicit requirement for knowledge itself.

Multiple realities are highly dependent on the ability of a human to interpret the range of initial views, to decide which is best for the problem and to synthesise a new view of those presented initially. Something is objective in this system if and only if it is the result or the product of a range of different views. The essential purpose of this is to allow a decision maker to act.

The Dialectic Inquiry System

The inputs in this are as complex as those of multiple realities. It consists of common data plus opposing assumptions or model. The guarantor of the system is conflict, which presupposes that the observer or decision maker can tolerate and learn from conflict.

In this system something is objective only if it is the product of an intense debate. Agreement may be reached by the group of decision makers, but can only be meaningful if concluding an intense debate. This debate might go further than addressing the root causes of the problem, it could be stimulated by the need to change larger problems around the causes.

The key factors of Dialectic IS are :

- There is no right way or wrong way, the debate should encourage different approaches.
- The true measure of success is determined by the solving of the larger problem area.
- Reaching consensus after meaningful debate. (Mitroff & Linstone 1993 : 80)

In the dialectic IS, the purpose of data is not to settle issues, but rather to surface the intense differences in background assumptions between two divergent positions. It attempts to zero in on the critical assumptions or key issues that underlie complex issues.

4.2.3 New Thinking

Unbounded Systems Thinking - UST

UST attempts to sweep in on all the IS previously discussed. It is the basis of the "new thinking" called for in the information age. In UST we will find that everything interacts

with everything and that all branches of inquiry depends on the other. It attempts to use the widest possible array of disciplines to solve our problems (Mitroff & Linstone 1993 : 91). In UST the traditional hierarchical ordering of the science is replaced by a circular concept or relationship between them and none is superior or better than any other.

UST and the multiple perspective method

Multiple perspectives represents UST. The terms agreement and analysis are subsumed under a new label of the technical perspective, in addition there are also the organisational or societal perspective and the personal or individual perspective. These perspectives are used together which reveals insights about a problem that are not obtainable in principle from the others.

Inherent in the use of Multiple perspective concepts are the following characteristics:

- The system designer or manager is a fundamental part of the system or problem being analysed.
- Individual ethics and value judgements are implicit in the selection process as are one's scientific and professional background.
- The value of using multiple T (Technical), O (Organisational) and P (Personal or Individual) perspectives lies in their ability to yield unique insights.
- Any complex problem may be viewed from any perspective.
- The scientific method operates within the framework of the T perspective.
- We cannot prove what perspective is right.
- Any two perspectives interact in a dialectic mode.
- A perspective may change over time. (Mitroff & Linstone 1993 : 99)

When using the multiple perspective concept, the selection of initial perspectives and their integration must be considered. It can be argued that the selection of the proper perspectives constitutes the test of effective decision making and implementation.

Guidelines for applying multiple perspectives are:

- Strive for a balance among T, O and P perspectives.
- Use good judgement in selecting perspectives.
- Recognise that O and P require different methods than T in obtaining information.
- Pay attention to the multiple impact, interdependencies and integration of perspectives.
- UST is non terminating. (Mitroff & Linstone 1993 : 107)

In UST every model of a problem we pick to represent it presupposes in an important sense every other model we could have used to present it. Thus every element or component is strongly inseparable from any other element or component.

Churchman in his definition of a problem states, "something is a problem if and only if it is a member of the set of all other problems".

UST is fundamentally transdisciplinary IS, this means in working on every problem, we are also simultaneously working on how we organise ourselves to solve other problems.

4.3 SOFT SYSTEMS METHODOLOGY

An introduction.

Soft Systems Methodology (SSM) is a learning system which focuses on complex problematical human situations, and leads to taking purposeful action in the situation aimed at improvements (Checkland 1990).

SSM starts a process of inquiry which results in an action, which unless defined as a conclusion, changes the problem situation and the inquiry thus continues. In principle, unless clearly defined, the learning cycle is never-ending .

SSM is a process of managing, and must take a view of what managing is and what a manager does. SSM assumes that different individuals or teams see things in a different perspective, due to their autonomy which leads to different actions being taken. The various perceptions will overlap to some degree, but never sufficient to solve the problem. The issues arising from this mismatch, provides much of the substance of managerial work.

Soft Systems Methodology articulates the systems idea. This idea was developed that a set of activities linked together in a logical structure to constitute a purposeful whole , could be taken to be a sub-system of an even larger whole system. Any system will have a purposeful activity as perceived by the various actors within the system influenced by the world view held by each actor.

SSM learns by comparing pure models of purposeful activities with perceptions of what is going on in a real world problem situation. Intuitively humans carry out this activity, but SSM provides an explicit kind of comparison, based on systems models used in an organised process which is itself a learning system.

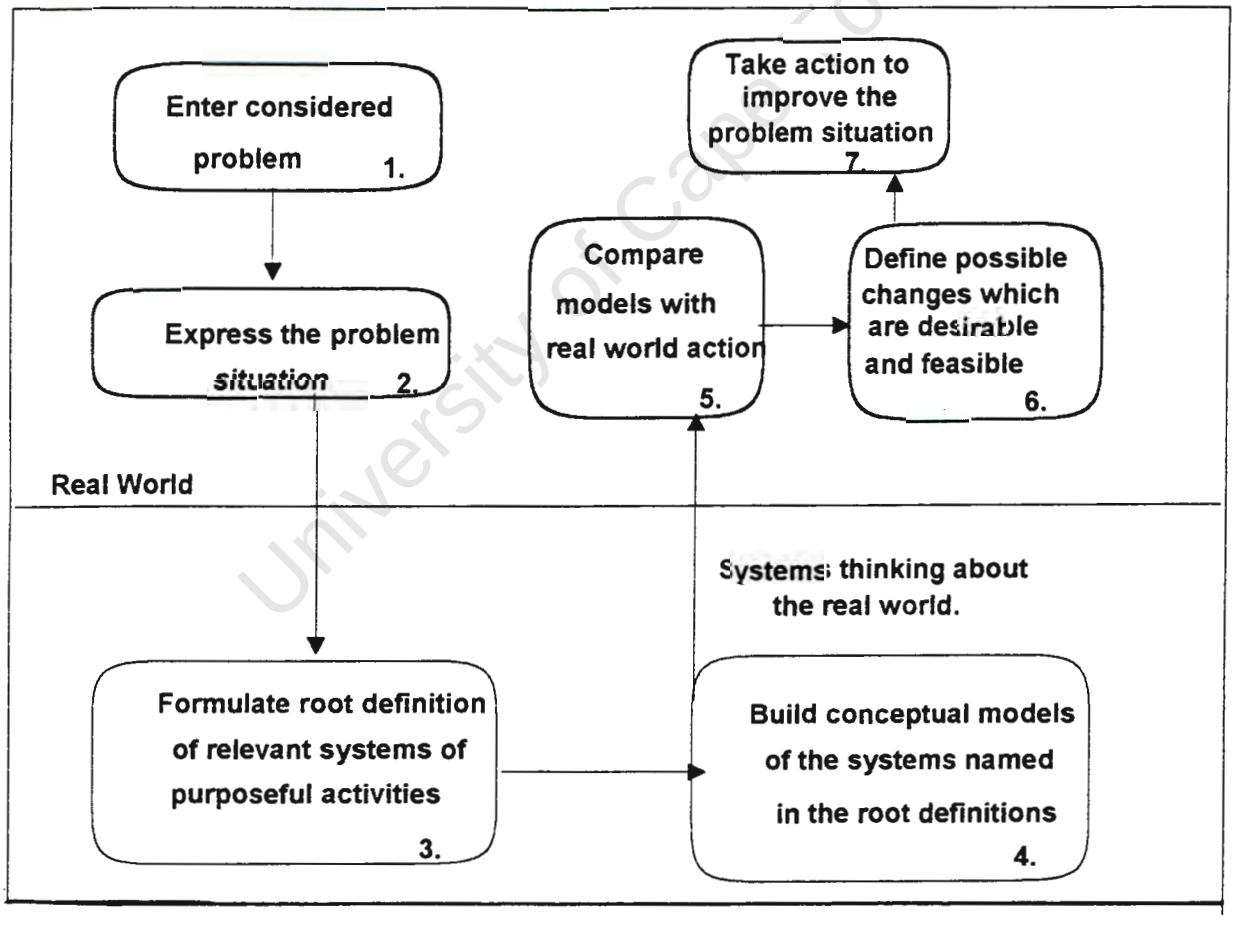
SSM is a participative process which proceeds via debate in addressing complex social problems in which the assumptions about the world as well as the logic of achieving its purpose are expressed in the systems model, as tested out.

4.3.1 The Stages of Soft Systems Methodology

SSM consists of seven stages, but it must be noted that in practical application it would not be essential to follow all the stages. It relies on individual experience to find out about a problem situation. Supplementing this, is the explicit use of systems thinking, starting by naming some system of purposeful activities which are relevant to exploration of the problem situation.

Activity models are built containing a number of named relevant systems. The models are brought into the everyday world and compared with actions going on out there. This modelling process is to provide a structure of a debate about possible changes. Leading from this debate would be possible implementation changes which must be both, systems desirable and culturally feasible.

The Soft Systems Methodology Cycle (Checkland 1990) . Fig. 6



4.3.2 Stage 1 and 2 Finding out

Finding out is carried out through three related analyses. Analysis one - take the intervention in the situation as it subject matter and identifies the occupants of the roles. Analysis two - Looks at the problem as a social system. It determines what roles are significant, what

behaviour is expected and by what values performance in roles are deemed to be good or bad. Analysis three - Examines the situation politically by asking questions about the disposition of power.

Stage two is essentially the process of labelling the various perspectives of relevant systems by gathering this information through interviews.

Stage 3 Formulating Root Definitions (RD)

This stage is concerned with writing down the names of some system responsible for carrying out the purposeful activity. This system must be relevant to finding a means of improving the current situation. A couple of scenarios are normally sketched out and the inquirer uses learning methods of determining the most effective possibilities. Root definitions should be constructed by consciously considering the CATWOE as detailed below. The main focus of a RD is the transformation which the system is hoping to achieve by changing some defined input into some defined output.

Formulation of Root Definitions using the CATWOE **Fig . 7**

C	-	CUSTOMER	Who is the victim / beneficiary of the activity ?
A	-	ACTOR	Who would do the activities ?
T	-	TRANSFORMATION	What is the activity expressed as ?
W	-	WORLD VIEW	What world view makes the definition meaningful
O	-	OWNERS	Who can stop this activity ?
E	-	ENVIRONMENT	What constraints does the system take as given ?

Using the CATWOE a coherent formulation of some RD is constructed and used to build up models for testing the situation in the real world.

4.3.4 **Stage 4 Building Conceptual Models**

This model-building process consists of describing the activities which are essential to the system named in the root definition and structuring them according to logical dependencies. The final model is that of a system which could adapt and survive via a process of communication and control, in a changing environment. An operational monitoring and control subsystem would be essential to examine the operations and take control action to change or improve them. Having defined the transformation process, we need to ask what serves as a measure of effectiveness, efficacy and efficiency.

In developing the model, the researcher must be disciplined to work only from words in the rot definition. Every phase in RD will lead to a particular activity in the model. The model

does not have to be correct, it should rather be a coherent representation of the problem situation and be tested against the real world.

4.3.5 Stage 5 Comparing Models and Realities

Here the researcher compares the models to what is perceived as reality. There are four ways in which this can be done :

- Simply record the differences which stand out between the models and the current perceptions.
- The second method is a more formal listing of differences which are observed. Here each model is used to define a series of specific activities for which answers are the sought in the real situation.
- Thirdly, you can operate the activity system on paper, describing how things might happen, given the RD in question.
- The fourth method consists of trying to build a model of a part of reality, similar to a model, thought to be relevant to it.

In conclusion, this stage provides the structure and substance of an organised debate about improving a situation, thought of as problematic.

4.3.6 Stage 6 Defining changes

The purpose here is to make the debate a coherent one, by making reality more or less like the models. The debate must generate potential improvements worth trying. The changes which are deemed necessary, must be systematically desirable and culturally feasible in the particular human situation. The world view detailed in the CATWOE, is a guideline to see that the changes are in accordance with the perceived situation.

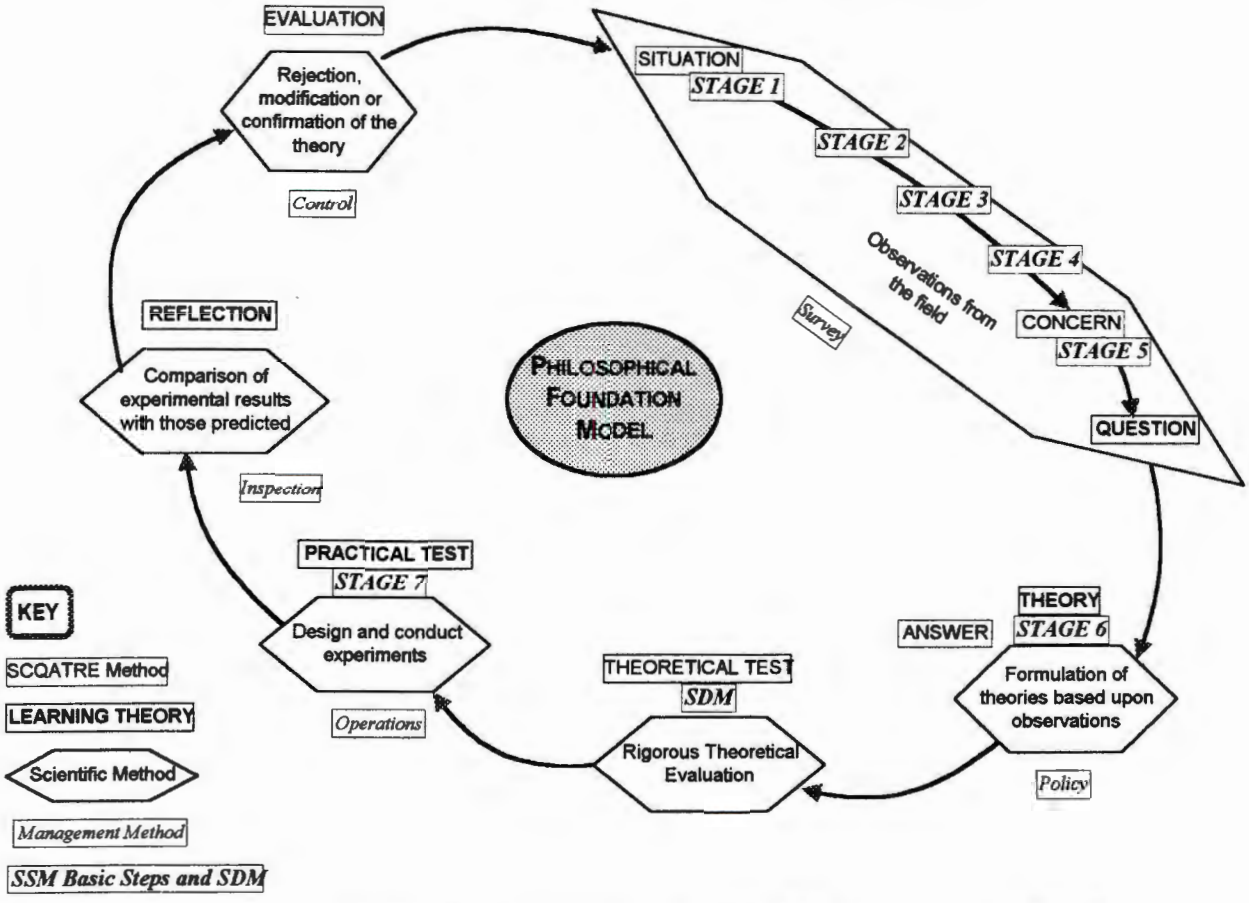
4.3.7 Stage 7 Taking Action

The changes identifies are required to be implemented to complete the soft systems methodology cycle. These changes will however, change the situation which, unless defined upfront, could result in the cycle being repeated, due to the open-endedness of this methodology.

Summary

SSM treats what to do as well as how to do it, as part of the problem. It accepts that the real world problems are more complex than pure models and therefore uses the models to structure a debate where conflicting beliefs can be tested. The underlying philosophy of SSM is that there are no permanent solutions and systems thinking has to be envisaged as a process which is never-ending and more of a learning system than an optimising one.

4.4 THE MODEL INCLUDING SOFT SYSTEMS METHODOLOGY



Diagrammatic Representation of the Model **Fig. 8**

4.4 CONCLUSION

The demands being placed on management in today's evolving business world has given rise to the need for a framework of inquiry which can respond to the changes taking place.

When we analyse the present situation at Howden Air described in Chapter 1 we will see that the difficulties facing the company would require a new approach to ensuring long term sustainability.

Charles Handy's learning cycle has been found to be too simple to resolve the problem. The simplicity of this method has resulted in introducing both the works of Revans and Peirce. Their work in conjunction with System Thinking adds more meaning to the model and allows for a more rigorous process of evaluating managerial issues.

The changing business world and the democratisation of the workplace in South Africa has replaced the former autocratic approach of the past. Previously decisions were often taken in isolation with total disregard for the effects on other facets of the business. The use of

multiple-perspectives and Soft Systems Methodology facilitates the need to gain a broad perspective of the problem situation.

The Model of Inquiry is now used to investigate the problem within Howden Air Industries with regards to the decentralisation of power. In the use of this framework I expect to uncover the hidden agenda of the various stakeholders and the true purpose of the system (organisation) being investigated. The situation described showed that the espoused theories are somewhat different to the theories in use. The model I believe could highlight the areas of conflict and concern. The application of the framework to the practical application could provide a comprehensive appraisal of whether to pursue the process of change and in so doing resolve the conflicting world views and align them to a common purpose for the good of the organisation.

To summarise during the development of the framework the following topics were covered.

- The philosophy of C.S. Peirce and the inclusion of his scientific method into the model.
- The inclusion of Systems Thinking and its methods so as not to view the situation in isolation thereby creating a better understanding of the problems of the company which is being investigated.
- The use of Soft Systems Methodology as a tool for inquiry into the situation from differing perspectives.

The following chapter is an application of the model to inquire into the situation at Howden Air Industries.

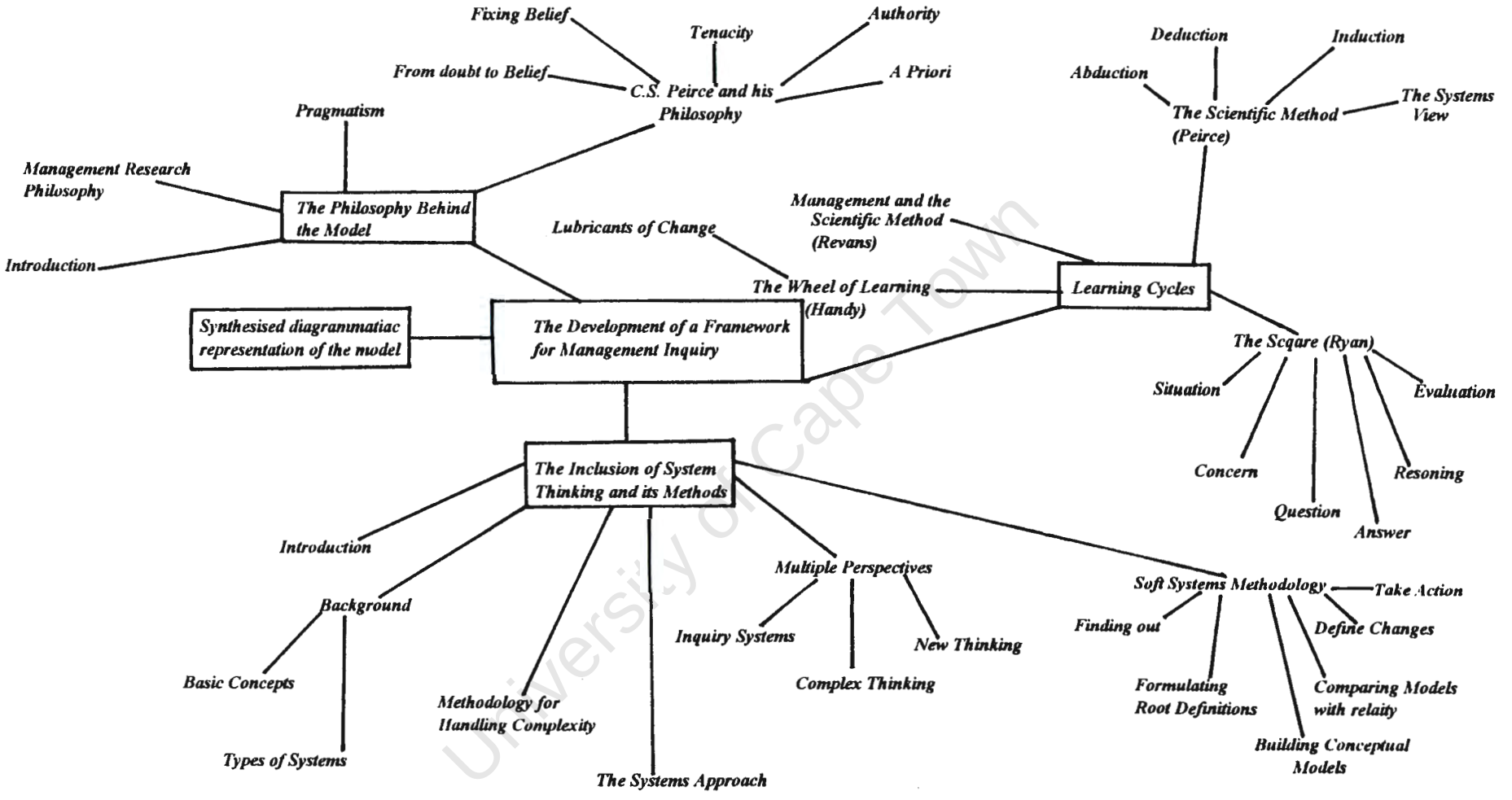


Fig. 8 A Overview of the Development of the Framework

PART 3

CHAPTER 5

APPLICATION OF THE MODEL FOR INQUIRY TO INVESTIGATE THE ORGANISATION

INVESTIGATING THE ORGANISATION (STAGE 1 - 5)

5. INTRODUCTION

The problem situation discussed in Chapter 1 covered the Internal Markets Model in some detail. The purpose of this chapter is to carryout an investigation by applying the model as a process of Inquiry.

In carrying out the investigation different levels of the organisation has been interviewed with a view to gain an understanding of the feasibility of implementing the project at Howden Air Industries. This is where I used Soft Systems methodology and multiple perspectives as a tool for sweeping in on different perspectives within the organisation. The investigation is concluded with a hypothesis which forms the basis of my arguments in developing organisational effectiveness through decentralising power. For the purpose of this report I have shown a complete cycle on the world view of the workers only with the other world views included in the appendix. Tables 1 - 4 show the summarised outcome of the results of the interviews.

Following the investigation, Chapter 6 focuses on organisation changes that would be required to successfully implement the Internal markets model as discussed. It looks at hard core issues relating to team work and a systems approach. Using the hypothesis and the changes presented a theoretical prediction is formulated and tested against past experience gained through similar projects within the Howden group.

The purpose of this Section is to set a framework for testing the Hypothesis developed after investigating the situation at Howden Air Industries. The test takes the form of a practical implementation which is described in Part 4.

5.1 STAGE 1 & 2

The internal market model is a concept which is very new to the South African manufacturing industry. Howden Africa can be seen to be one of the leaders in the implementation of this concept. Due to it's infancy it is difficult to get a very wide range of perspectives. For the

purpose of this report I have decided to focus on the major stakeholders who ultimately represent a broad range of employees. They are:

- Workers
- Unions
- Supervisors
- Senior Management

Worker World View

The expectations of the shop floor has been raised by both Unions and the Government which has lead them to believe that the benefits of the new South Africa would be substantially superior to that of the past era. Needless to say that the benefits raised by any organisation has to be gained through hard work. The low level of productivity in Howden Air Industries and South Africa in general has given rise to the concept of participation, empowerment, power sharing and democratisation of the work place. For far too long management have been the beneficiaries of successful organisations and the time has come for the playing fields to be levelled. The internal markets model is seen by the work force as the vehicle to facilitate these changes. It is strongly felt that the major contributors of any productivity improvement which ultimately benefits the company is as a direct result of the efforts of the work force. For this reason the benefits of improved output should be shared with the workers.

Failure to do this will result in the failure of the company. Internal competition is also good as these employees who do not contribute their fair share will now be worked out of the system. The control of management has to be decentralised and power given to the shop floor. The time has arrived for the efforts of the work force to be rewarded by giving them the incentives to work harder. It has been a legacy of the past that management will benefit at the expense of the workers. By and large management is the bigger overhead as they are the non-producers in the company. The view of the unions and the workers at large is that management always benefits by earning bigger salaries, driving fancy company cars and having access to special treatment from the company. If one looks at Howden Air the shopfloor to administration employee ratio is 2:1. Being a manufacturing company this is reason enough to argue the fact that management is being carried by the core producers. Company cars for example are primarily given for the benefit of the individual employee and not for the good of the company. The salaries earned by mangement are in some instances about ten

times more than most of it's employees. Performance bonuses are paid to senior management with industry regulated bonuses paid to the shopfloor. Today however the thinking is that of profit sharing bonuses at all levels but this has yet to materialised. By implementing the internal markets model wastage of money through reduction of overheads and increasing output by workers being more productive will undoubtedly be the result.

5.2 STAGE 3 - FORMULATING ROOT DEFINITIONS

Workers World View for the IFMM

C	=	Customer	Workforce
A	=	Actor	Workforce, Management
T	=	Transformation	Need to empower employees - Empowered employees
W	=	World view	Worker empowerment is essential for the long sustainability of Howden Air Industries
O	=	Owners	Howden Africa Corporation
E	=	Environment	Economy, external competition

Root Definition 1.

The internal markets models is a system owned by management (HGSA) to satisfy the need of empowering the work force for the benefit of both employees and employer given the constraint of the declining economy and fierce external competition.

It would appear from the many discussions that the implementation of the model will lead to overnight success. The investigation however has lead to a common fear that many issues still need to be addressed prior to implementation. What needs to be understood is that any meaningful contribution to ensuring long-term sustain ability for any organisation would require a well thought out plan which can take months before results can be achieved.

The major question for Howden Air Industries would not be whether to adapt the organisation to one centred around the internal markets model, but rather 'what needs to be done to successfully implement the project'.

This section will attempt to highlight the emerging themes raised during the immersion phase using soft systems methodology by investigating more intensely the major stumbling blocks to achieving success.

5.2.1 Emerging Themes

Contained within each World View were themes which needed management focus in overcoming many obstacles. This section is a summary of these themes. (See Appendix).

Education and Training

Education more than any other factor determines the long term fortunes of any nation and even more so for organisations. It is a source of progress for all who have been fortunate to have been given a good education as testified by anyone who has been down this road. The more knowledge intensive we become at Howden the sooner this principle will be entrenched within the organisation. Formal education is the key source of obtaining life skills, for this reason companies must encourage their previously disadvantaged employees to further their knowledge by educating them in the basic skills of numeracy, literacy, business philosophy and basic financial analysis skills.

Employees and management have identified inadequate education as a major weakness, which has resulted in an inferior skills level of both the operators and their supervisors. The shop floor strongly believes that an increase in education and skills training will more than assist the ailing state of the company and lead to increased remuneration and individual development.

Training and development must be focused on enabling the organisation to achieve it's objectives as defined in it's plan for the future. A needs analysis must be conducted at all levels of the organisation to determine the critical issue requiring attention.

A root definition of education and training can thus be determined using the following Catwoe.

C	=	Customer	Company, employees
A	=	Actors	Management
T	=	Transformation	Urskilled work force to skilled work force Ailing company to long-term viable
W	=	World view	Education and training will benefit both employees and the company
O	=	Owner	Management
E	=	Environment	Budgetary constraints, individual capability constraints

Root Definition 6

Education and training is a system to develop skills which will enhance the long-term sustainability of the organisation.

5.3 STAGE 4 BUILDING CONCEPTUAL MODELS

Introduction

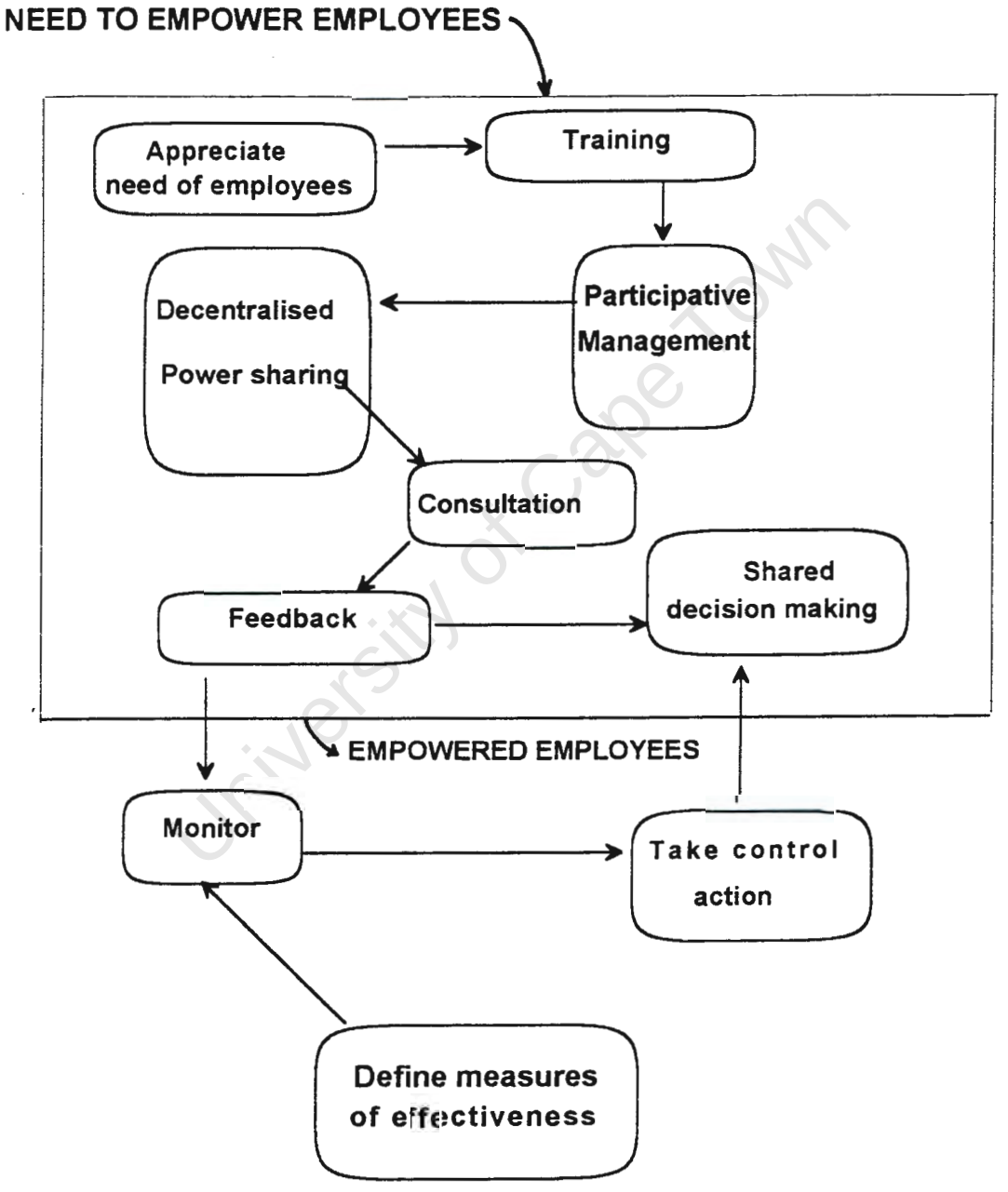
The formulation of root definitions were done using the world view of the various levels within the organisation. Resulting from these views were strong emerging themes for which root definitions were also formulated.

The model process will focus on the world views which contains the emerging themes or activities within one or more view, hence there will only be five models to describe the activities within each system.

Root Definition 1

The internal markets model is a system owned by management to satisfy the need of empowering the work force for the benefit of both employees and employer given the constraint of the declining economy and fierce external competition.

Fig. 9



5.4 COMPARING MODELS WITH REALITY

This stage focuses on analysing the differences of the model activity to the perceived reality. The method for doing this is by listing the model activities and showing what the perceived reality is at present.

Workforce's World View **Table 1**

No	Model Activity	Perceived Realty
1	Appreciate needs of employees	The worker on the shop floor is still being treated in an inferior way by not being allowed to actively participate in discussing matters which affect them directly.
2	Training	Training is only focused at the upper levels in the organisation. Although workers are encourage to improve themselves, the conditions are not being created by management for this to actually happen.
3	Participative Management, Power sharing	Many attempts have been made to practice participation. The lack of maturity on the part of the work force and a reluctance from management to share it's power has often prevented this from being successful.
4	Consultation	Only of late has consultation been introduced within the organisation. Unions, workers and staff all participate in voicing their opinion, with management having the responsibility of making the final decisions
5	Feedback	The systems which presently exist within the organisation have often been blamed for the declining state of the company. A serious shortcoming is the lack of information and not feedback loops to the originator for reviewing the situation.
6	Shared Decision Making	Decision making is only made at management

		level. employees are not always given the opportunity to contribute to the decision making process.

5.5 SUMMARY OF THE INTERVIEWS

The investigation which was conducted using one on one interviews and discussions has lead to widespread interest within the organisation. Clearly there appears to be a need to re-focus the organisation and change the present style of managing. The two different camps although radical in its view show signs of agreement on most issues.

The immediate implementation would appear to be resisted by certain sectors of the company as was expressed during discussions. It would seem to be appealing to most employees as the benefits are rewarding if success can be achieved.

Many issues were raised as being critical to the success of the project which requires further research to justify their arguments. The underlying principles of the internal markets hinges around three core principles, viz transform the hierarchy into internal enterprise units, create an economic infrastructure to guide decisions and to provide leadership to foster collaboration. These are all dynamic components which are not entrenched within the organisation at present.

Having concluded stage 4 of the Soft Systems Methodology there seems to be a common feeling on some core issue which needs to be addressed prior to implementation. For the purpose of this report the following section will be used to understand these issues with relation to the principles suggested in this model.

A summary of the results coming out of the remaining world views can be tabulated as follows:-

- There is a lack of education and training
- Multi-skilling is non-existent
- Democratisation is practiced selectively
- Empowerment is only a buzz word
- Power sharing is beginning to take place
- Responsibility is primarily vested with management
- Lack of maturity is restricting the empowerment process

5.6 FORMULATION OF HYPOTHESIS

The situation at Howden Air calls for a review of management philosophy. The espoused theory and the theory in use has to be realigned to create a sincere effort to successfully transform the company. The use of the model for inquiry will help to unravel the hidden agenda of certain individuals in the company. Here I refer to the union representatives for example fighting management by using the workforce to build a platform for them to gain power to pursue their own personal ambitions. Certain individuals would go to great lengths in creating conflict by blaming others not as a means of resolving the problem but to gain recognition from management. Management conflict has reached an all time high with each manager protecting his own territory. The overall success of the company has been overlooked in favour of departmental effectiveness, irrespective of the effect on other departments. The non payment of creditors or the freezing of customer accounts in isolation by the finance department is seen as good financial control, whilst this may be true, a more effective way of dealing with the problem would be to discuss it with the relevant departmental manager in an attempt to resolve the issue. The culture of management versus workers and the inter departmental struggles must be transformed where teamwork and cross functional communication becomes the order of the day. Management's focus must be on moving the company into a new dispensation by creating the conditions for the employees to be effective in their respective jobs. The short-term cost cutting efforts are short sighted and long term planning has to be seriously considered. The lack of skills and training caused by the high staff turnover and retrenchments must be improved. This has had a direct bearing on the level of maturity of both management and the workforce which has led to so many confrontations. The democratisation and empowerment of the workforce will undoubtedly be premature if the level of maturity of all employees, especially management is not raised and a climate of team learning is entrenched in the organisation. The relationship between management and the unions will have to be improved as the lack of trust on both sides will do very little to guarantee the success of this project.

My belief is that unless a culture which facilitates team learning and cross functional communication where empowerment and democratisation is implemented as part of the process the transformation process will not be successful.

The successful implementation of the internal free markets model would depend largely on the ability of the organisation on the one hand in changing it's culture to one which facilitates team learning and can respond to a rapidly changing environment of a very demanding

business world, where central control is dissolved and an environment of participation is developed for the good of both the company as well as the employees.

On the other hand the maturity of the employees at all levels will play a major role as individual development will be an essential ingredient in empowerment as a lack of readiness could result in failure for all.

To Summarise : Actions Required

- A review of management policy
- Use of multiple views to reach consensus
- Transform the culture of the company
- Plan for long term success
- Raise skills at all levels
- Improve union/management relationship
- True empowerment
- Decentralise power
- Educate, train, train, train.

Predicted Benefits

- Participative culture and teamwork
- Shared purpose with common culture
- Improved output
- Stable environment
- Common goals creating long-term viability
- Truly empowered employees

5.7 CONCLUSION

The investigative phase has highlighted many aspects about the organisation as a whole. Although the internal markets concept has been accepted in principle there are many fears which have to be overcome to implement this process successfully.

The theme which has been most dominant in speaking to individuals within the organisation is that a radical change would have to take place if the concept of teamwork and empowerment is to work for us. The present culture is certainly not conducive to active participation which leads me to the conclusion that the organisational effectiveness has suffered due to a lack of learning. With reference to Peter Senge's Book 'The Fifth Discipline, we will have to

overcome the learning disability which we are faced with before implementation could be successful. During the discussion on the problem situation in Part 1, I introduced the topic of learning disabilities. Having been employed at Howden in a managerial position has afforded me the opportunity to have a clear understanding of how we have neglected the learning process. We have become so involved in crisis management resulting in decisions often being taken in isolation. The argument which concludes this report is very much in line with both the principles of the IMM as well as those of the Learning Organisation. Moreover the move towards workplace democracy will force organisations to pursue these philosophy's in an attempt to improve it's sustainability.

CHAPTER 6

THEORETICAL TEST

DEFINING THE CHANGES FOR SUCCESSFUL IMPLEMENTATION OF THE IMM AT HOWDEN AIR INDUSTRIES (STAGE 6)

6.1 INTRODUCTION

The hypothesis explains the need for changing the basic ways of managing the organisation and highlights the need for the development of the employees within the company.

This section of the report identifies those changes which would have to be addressed in order for the organisation to be turned around. It covers issues such as training and development, organisation structures, participative management and controls which would also need attention to successfully implement this process.

The purpose of this section is to compare the changes which need to be made, with those changes implemented during similar projects within the Howden Group. The report firstly describes the privatisation project at it's head office where a company, Masakane, was registered as a closed corporation and secondly looks at the privatisation of the transport department at Howden Air Industries.

Many theories and philosophies exist on how to change corporations and management practices. These often work in the short term and after the novelty of change has passed the organisation moves back to its declining state. This is natural as most people can handle change for the better with immediate results, but when change is a gradual process and pain is encountered then the fun goes out the door and so does the enthusiasm of the people.

We often think of change and improvement coming from the outside in rather than from the inside out. Even if we recognise the need for change within, we usually think in terms of learning new skills, rather than showing more initiative to basic principles. As was suggested earlier significant breakthroughs in Management thinking would be required to break the traditional ways of thinking.

For Howden Air Industries this new way of thinking is imperative in changing the culture within the organisation. On the other hand there are the hard core issues which also need to be addressed and in so doing lead to long-term sustainability through the successful implementation of the IMM. The following is a description of the issues which require management attention.

DEFINING THE CHANGES

6.2 TEAM LEARNING

As has been repeatedly stated in not only this report but thousands of other publications, books and theories, is the fact that individuals make an organisation collectively. The re-admission of South Africa to the international sporting arena can be used as a comparison. Four years ago our sportsmen and women were regarded as having the potential but had a long way to go to be among the best. Three years later we win the Rugby World Cup, we rise to new levels of consistency in our cricket, in soccer we clinch the Africa Cup of Nations and in Atlanta we get some gold and silver.

Hours of dedicated training, coaching and practice, coupled with a willingness to learn have underlined these successes. The same applies to business and individual development. The team learning concept is the ability of members of the team to be able to enter into joint thinking and decision making thereby facilitating free flowing meaning through a group, allowing the group to discover insights not attainable individually. Team learning is vital because teams, not individuals are the fundamental learning unit in modern organisations.

6.3 EMPLOYEE DEVELOPMENT

The most essential aspect of any business is it's people. Therefore the most important step to ensure that they are totally committed and ready for the implementation of the Internal Markets concept is to actively develop them. The following factors will assist in preparing the work force:-

- Training programs on general business principles to create a higher level of understanding.
- Training of the IFMM must also be carried out to ensure organisational readiness.
- Problem solving skills must be developed to ensure a higher level of proactive management.
- A forum for continuous learning must be created to allow individuals freedom to explore new innovations.
- An objective reward system must be created to ensure innovation
- Total commitment at all levels of the company would be imperative for the success of the IFMM.

6.4 TRAINING

Training will have to be provided to create a common understanding of the systems which are in place. If the data is not understood the motivation to improve will be missing. When setting up the standards, all employees must be involved in the process. Skills will have to be improved to reduce wastage and scrap.

By facilitating this training management can expect productivity to improve. It is only when employees are empowered can we expect improvements to happen. Assuming we built fans which were not according to customer specification but the details are not known to the worker, we can expect him to continue building it in the same way, if he were trained to understand the needs of the customer we can expect him to strive for continually improving the process.

6.5 PARTICIPATIVE MANAGEMENT

Total commitment can only be achieved if the employees have the opportunity to contribute to the effective managing of the company. The following factors could result in greater participation.

- Quality circles, green areas and open forums must be established where everyone has the chance to contribute.
- Promote autonomy to encourage active participation at all levels. Breaking down of authoritarian management styles
- Open communication must be allowed to create a common understanding throughout the company.
- Total responsibility and accountability must be placed with all the players of the respective operating units.
- We must be supportive of each other through the good times as well as the bad.
- We must remain loyal to the needs of the organisation, our customers and colleagues.
- Teamwork must be promoted to ensure mutual co-operation and support.
- Total elimination of empire building and company politics must be encourage.

6.6 ORGANISATION RESTRUCTURING

Change is a word that scares the hell out of all employees within most companies. It often means retrenchment or more work for those left behind. Organisational change is overdue in South Africa with its move back into the international arena. Sweeping change under the

carpet is a no go. We will have to adapt our organisation to be more cost effective, more efficient and more responsive to market fluctuations.

The Internal Markets Model relies heavily on empowerment and participation. Needless to say structures would have to be re-engineered to accommodate these principles. We need to make those at the lower level of the organisation more accountable, and create an environment conducive to the production of superior customer service. Here I refer both to internal as well as external customers.

A suitable model for Howden Air to use in its restructuring project could be as follows:-

I recommend that the organisation be restructured as per the attached model. The reason for the design are for the following:- See Fig 10

At a top level are the viable systems who interface with each other to maintain co-ordination within the organisation. Operations management is the nerve centre to ensure efficiency and for creating the necessary conditions for Production management to be effective at a middle level. Production management in turn is responsible for creating conditions for the lower level autonomous profit centres to remain viable.

A key function would be to monitor performance for the centres in order to focus on the key objectives within the larger organisation. Team leaders of the lower level will however have total control over their unit and fully accountable for the output performance. The lower level units are independent autonomous structures that can adapt to a rapidly changing environment much more quickly and innovatively that traditionally centrally controlled organisations. The term level is used only to differentiate between the three levels and not to show significance.

6.7 CO-ORDINATION

The co-ordination function facilitates the interaction of the various levels within the company. It allows for the collection and distribution of information between the various subsystems of the operational units. The co-ordination functions will ensure that production meetings are called where issues such as day to day scheduling, quality control, inventory is co-ordinated.

6.8 MONITORING AND CONTROL

The monitoring of the operational unit is carried out to ensure that they are doing what they are supposed to be producing, both effectively and efficiently. This is done by the

manager/supervisor concerning himself with the methods, procedures and plan that the various departments will utilise. By having effective control the effective use of resources such as man, machine and money is enhanced. The level of management ensure that the planning is adhered to and that any potential problems are averted or rectified by having a short feedback with the subsystems of the operation unit. This forms the basis of its day to day activity by being able to take effective decisions for the good of the larger system.

The control function is operated as a system to ensure that the operation system remains viable by ensuring a broad, holistic approach to its efficiency. The control function if implemented correctly will enhance the organisations sustainability by interpreting models for improved productivity, quality, planning and achieving of standards.

The control function is more of a process of countless local decision making process' that continually refer to changes, so as to maintain healthy conditions for stability and growth

6.9 THEORETICAL PREDICATION

The hypothesis developed earlier shows a clear lack of maturity on the part of many employees. The philosophy of Howden group is one which subscribes to the concepts of empowerment and power-sharing. The management of Howden Air would appear to view this as threatening to their positions and have not made a sincere effort in changing the organisations strategy. The investigation has however identified many aspects which would be required if the transformation process is to be successful. The participative styles adopted in other countries has shown remarkable results with productivity surpassing all expectations. The hierarchical autocratic structures have proven to be restricting and time consuming often leading to a breakdown in communication. The raising of skills levels both from a technical perspective as well as an administrative level will enhance the culture of team learning. Although I argue the need to decentralise power, there are certain disciplines such as financial controls which would required a formal control function.

Given the above the prediction reads as follows:-

The philosophy of Howden Africa is to truly empower it's employees at all levels of the organisation. When one reflects on the projects within the group and the success which can be achieved if application to the process is adhered to, the future appears to be great. I do however believe that the implementation will not go by without it's problems.

Many managers and employees will consider these changes as quite radical by standards and will oppose it as far as possible. The foundation is however laid for a move in the right

direction where a spirit of trust will be established and development of individuals resulting in true empowerment for all.

If this were established and the transformation process successfully implemented the changes would be most encouraging. When I reflect on Masakane and the turnaround of that company I have no reason to doubt that the turning point for Howden Air has arrived and a return to profitability can be expected during the 97/98 financial year.

6.10 CONCLUSION

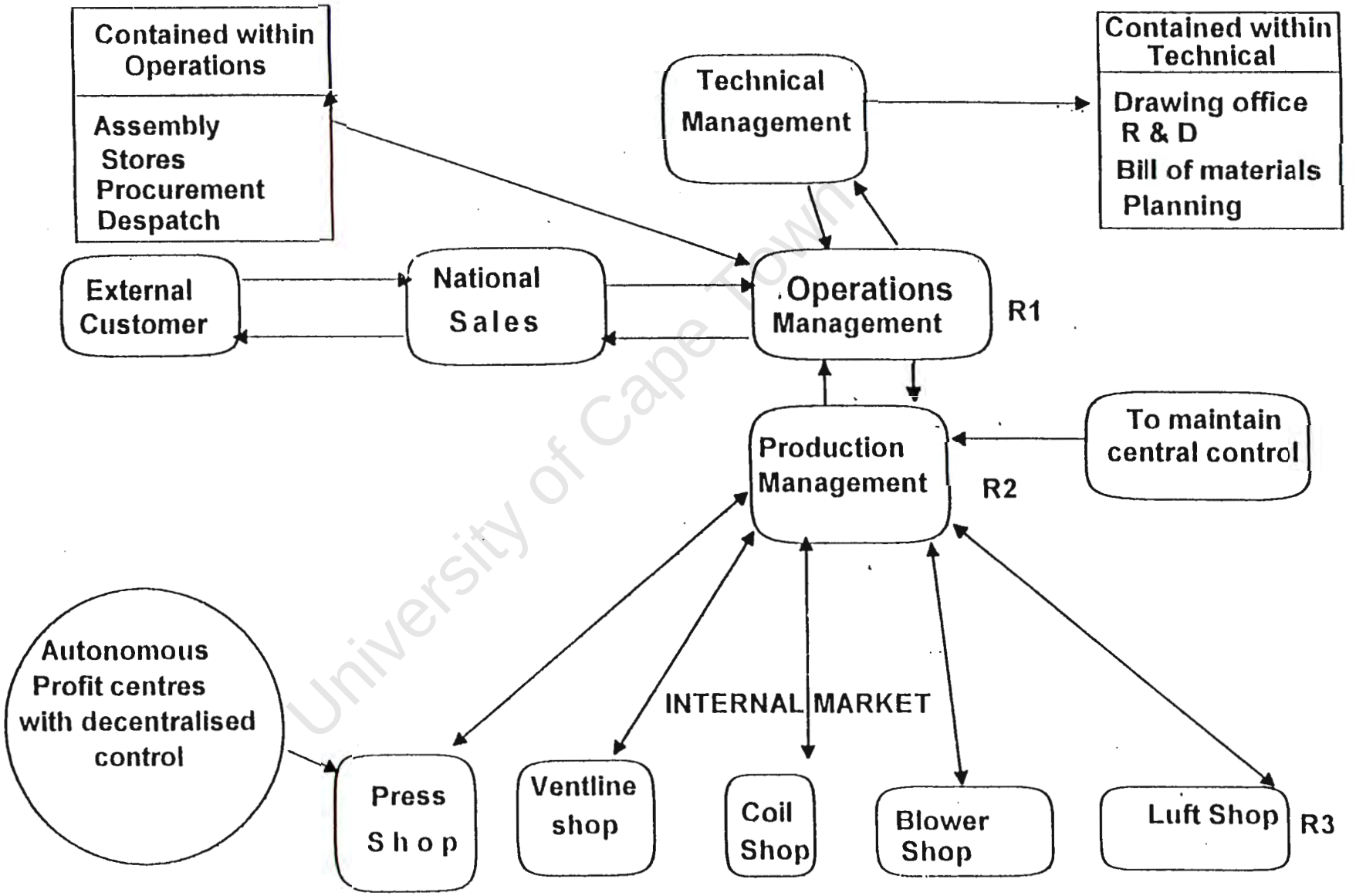
In the absence of systems thinking, local decision making can become myopic and short term. This will happen if local decision makers fail to see the interdependencies by which their actions affect others outside there local system. Many senior managers are reluctant to give up control. Understanding that it is usually impossible to control a complex organisation from the top can help these managers begin to give up the need to feel in control. Unless they believe that the quality of learning, the ability to adapt, the excitement and enthusiasm and the human growth fostered by localness are worth the risk, they are unlikely ever to choose to build a locally controlled organisation. In Howden the group philosophy is conducive to power sharing and is a cornerstone of its success. This together with the need to be more competitive has made the local control more attractive than to most others in many ailing companies.

Individuals are being called in to contribute more and more, the worry is however that most employees believe they can have less influence on events than before by sharing control, employees will soon learn that they too can change a part of our world, that all individuals do matter and that we have an effect on our environment, our growth and our results.

The Chapter has focused both on the hard-core issues relating to operational issues as well as softer philosophical topics focusing on individual inputs to effective team learning.

The next phase would be to relate these changes by comparing it to practical implementations which would either prove the hypothesis to be correct or leave me with the need to review my hypothesis.

A case study showing the actual implementation at Howden Fluid Transfer, a subsidiary of the Howden Group is used to test the hypothesis theoretically.



HOWDEN AIR INDUSTRIES SYSTEMS DIAGRAM

CHAPTER 7

A CASE STUDY SHOWING THE PRACTICAL APPLICATION OF THE INTERNAL MARKETS MODEL WITHIN THE HOWDEN AFRICA GROUP

7. A REVIEW OF PAST EXPERIENCES AS A THEORETICAL TEST OF THE HYPOTHESIS

7.1 INTRODUCTION

Improving productivity in South Africa is certainly one of the most challenging tasks that today's organisations are being faced with. For Howden Africa this is no different, hence the focus of the Company has been centred around improving the overall performance of it's manufacturing facilities. With it's participative and open-door policy and it's belief in privatisation for individual empowerment, the Board of Directors, headed by Mr J.C. Moodie, have adopted the team approach to Management which is both dynamic and progressive, contributing to benefits such as increased performance, improved quality, higher levels of job satisfaction and the release of creative forces which facilitates effective problem solving. A test of this statement is demonstrated in Part 7.3

This case study is aimed to show the potential benefits that can be achieved by adopting the principles embedded in the internal market's model. Using Howden Africa as an example we will draw on actual case studies where the team approach has been successfully adopted.

7.2 GENERAL BACKGROUND TO HOWDEN AFRICA

Howden Africa is a recently listed company on the Johannesburg Stock Exchange and is a subsidiary of the internationally based Howden Group PLC of Scotland. It is a market driven and customer orientated company which specialises in supplying equipment to the air, gas handling, refrigeration plants, construction, mining and processing and packaging markets. The specialised mechanical and management expertise of Howden Africa embraces all key industries and ranges from the design, manufacture and installation of the various types of fans, pumps, heat exchangers, compressors, blowers and refrigeration plants.

Howden Africa has adopted the policy of diversifying it's S.A. interests by acquiring additional companies lending it's support to strengthening the S.A. economy by promoting exporting through improved manufacturing facilities.

The management styles of Howden Africa critically influence the total quality management system, with employees acknowledged at it's most important asset. With considerate budgets

set for training and development of personnel this sound business philosophy has encouraged active input at all levels of the organisation and it's flat management structure has created numerous opportunities for continuous improvements.

7.3 THE CHANGES MADE AT HOWDEN FLUID TRANSFER

Howden Fluid Transfer is a manufacturer of pumps which had a staff compliment in it's machine shop of 14 employees. After under performing for some time an analysis of the company was carried out with the following problem areas being highlighted.

- The foreman of the machine shop did not take responsibility and identified with the workers rather than with management.
- Informal reporting and instructions were the norm.
- Excessive overtime was worked causing under recovery of overheads.
- Morale was generally low.
- The general attitude was more 'what can my company do for me as opposed to what I can do for my company' to be more effective.
- No strong leadership was in place.
- There was a general lack of discipline within the machine shop.

7.3.1 The Rationale Behind The Changes

The assets of the company had been paid up and it was a vision of the Group Managing Director's that by empowering the employees together with strong leadership and sound management the machine shop could be a viable proposition.

The skills and knowledge of all employees were under utilised and the availability of a machine shop similar to this was hard to come by. The implementation of the markets concept would not only benefit the company but also be in line with the overall objective in uplifting the under privileged within the South African economy.

7.3.2 Implementation Proposal

A proposal for the project was prepared and forwarded to the Board of Directors for approval. The summary of it's contents were as follows:-

- The operating unit would consist of the remaining seven employees with a strong leader heading the unit as a managing partner.
- Shares would be paid off over a fixed time period.
- Performance bonuses would be paid out on an equal basis, regardless of shareholding on a quarterly basis.

•All expenses would be paid for by the unit which would include a central reallocation to cover administration, clinic, accounting services and MIS which would be supplied by the group.

•All employees were transferred from hourly paid to monthly paid with overtime work being at no charge.

•Rental on both the premises as well as the machines were charged at preferential rates.

•Any working capital required would be financed by the group at the prime lending rates.

After consultation with the shareholders and the Group Managing Director the above proposals were accepted without hesitation. The support for the project was tremendous with excellent ideas brought forward on the outset.

A general labour relations meeting was called by Mr Jan Moodie who informed the employees and unions about the planned project. Many reservations were highlighted with the main one being 'is the employee going to benefit.'

Like any venture, a certain amount of doubt and risk is always in the forefront for all concerned, but the overall success could not be guaranteed. The Group was however prepared to guarantee that if the project was unsuccessful, full re-employment would be given to all shareholders.

Having this safety net the name 'Masakhane' was registered on 12 June 1995 as a closed corporation with a formal legal contract drafted between all the shareholders of the cc and Howden Africa Group.

7.3.3 **Contract Contents**

•Masakhane will be given the first opportunity to quote on work for Howden Africa.

•Prices would be determined upfront for standard work.

•Masakhane would have to compete with other companies who are free to quote against them.

•Re-work would be for the account of Masakhane.

•Constant training will be carried out within the company.

•Additional equipment will be paid for by Masakhane shareholders.

•In addition to the above the legal aspects of payments and financial information was concluded in the contract.

7.3.4 Problem Areas

- A culture had to be developed to change the attitude of all employees. The current situation has changed radically over the past year which has been as a direct result of improved earnings for all the shareholders.
- The 'baasskap' attitude was still prevalent in the early days.
- A lack of discipline was a serious problem.
- Abuse of fellow employees was causing friction within the team.
- Resistance from the Unions, due to a loss of members.

7.3.5 Benefits Achieved

Having had the contract in place the company started operating as an individual unit with lots of teething problems. The level of commitment was at an all time high and the gross output was exceeding all expectations. With the quality standards in Howden Africa, a high reject rate was however being experienced by Masakhane and suddenly things seem to slow down. Not wanting to fail Ethel Boone, the Managing partner addressed these issues in an amicable way and turned the nett productivity from a loss situation to a profit within the second quarter of operation. By the end of the first year, bonuses totalling R30 000 / employee were paid out from the profits which had been made within Masakhane.

The latest developments are that with Howden Africa's recent acquisition of two additional companies, Masakhane has embarked on an expansion program to gear itself to handle larger volumes from Howden Africa. New machines have been purchased and the company has moved in with the new pump company to offer quick responses to the many demands being placed on them by Howden Africa.

From a financial point of view the profitability of the pump company has been improved with the overheads being reduced and the output increased through improved productivity.

During a recent interview with all the shareholders a definite improvement for all employees has been achieved with a summary of their views as follows:-

- Financially all shareholders are happy with their present income and feel that the opportunity to earn more is much greater with Masakhane than before.
- The conditions within the factory have been drastically improved as everyone has had an active part to play in improving the safety and housekeeping. There is a desire to be trained in other skills in order for a greater contribution to be made. Employees are keen to learn the operations of not only their machine but also those of fellow employees.

- The bonus paid during the first year has not come cheaply as the sacrifices were quite substantial. From a social point of view free time was more of a luxury than before as the commitment and the will to succeed required long hours from time to time. Friends started questioning the new found fortunes as most shareholders came from a disadvantaged background and suddenly their lives started improving. Employees in the group have become envious of the success achieved by the Masakhane project.
- The biggest benefit has been the empowerment of all the shareholders to partake in the decision making process and the power to protect their rights within the workplace.

7.4 SUMMARY

The success of Masakhane has led to a widespread interest as to how others can follow the example set by them. The visionary leadership of Jan Moodie has proved successful for Masakhane, Howden Africa and most importantly the shareholders of Masakhane.
Having exceeded expectations Howden Africa has now focused on involving the other companies within the Group on similar projects. At Howden Air Industries the transport side of the company was re-organised in line with the internal markets principles. The management have been in the process of negotiating with the workforce as to how and when to implement a similar project for Howden Air Industries with the first stage of implementation agreed upon in principle.
The internal markets principles has most definitely contributed in improving organisational learning, enhanced cross-functional communication and allowed for an entrepreneurial culture to be created. The formally centrally controlled organisation has been transformed into a more flexible, open-ended relationship with a participative and power-sharing form of management which has responded well to the ever changing business environment in which it has to compete.

7.5 THE PRIVATISATION OF THE TRANSPORT AT HOWDEN AIR INDUSTRIES

Introduction

Having looked at several alternatives in our despatch department over the past two years, many changes were made but very few which sustained itself for any length of time worthy to be deemed successful. During the recent restructuring the privatisation of the despatch department was yet again discussed and finally decided upon to privatise the transport part of

the business. The following is a description of the events discussed and the actual results achieved.

7.5.1 Rationale behind the Changes

The need to reduce operating costs within the organisation and reduce the conflict between the unions and management was seen as critical to overcoming some of the problems facing the company.

The shop stewards committee chairman who at the time was very active in union activities fighting management whenever the opportunity arose was also the driver/supervisor in the despatch department. The time spent on union activities was seriously affecting his performance and that of the department with many complaints being received from both customers externally as well as internally. This together with the need to empower employees by utilising their skills and knowledge it was felt that privatising the transport function would be the solution to many of the existing problems.

7.5.2 Implementation Proposal

A proposal was discussed between management and the concerned employee. The summary of the contents are as follows:-

- The transporting of all products locally will be carried out by company X.
- All postage and banking will form part of his responsibility
- All the vehicles required to carryout his duties were to be sold by Howden to company X at a market related price, which would be paid off over twelve months at prime interest rate.
- The said employee will be fully responsible for company X and will liaise with the operations manager and stores controller for daily work to be issued.
- A predetermined market related price was negotiated based on a fixed rate per kilogram of goods transported
- A weekly fixed cost will be paid as a support safety nett to ensure short term sustainability.
- Payment will be paid weekly in arrears
- Central re allocation cost for telephones, computers tea will be charged
- The running cost of the transport including petrol, maintenance, licensing, insurance will be borne by company X.
- Company X was at liberty to hire whoever it required, the cost of which will be for their own account.

7.5.3 Implementation

As the employee was affiliated to the union, the negotiations were engineered in such a way that the unions were not party to the decision. Management felt that it was a strategic business move which if pre-empted could jeopardise its success. The employee felt that involving the union would create tension within the ranks and he would be classed as selling out his members. All negotiating therefore took place between management and the concerned employee.

The content of the proposal was agreed upon after consultation and only then was the union and work force informed of the decisions. This was seen as being under handed by the work force but a strong commitment was obtained by the less radicals to support management in transforming the organisation with management reciprocating by promising further opportunities to other employees if the occasion arose. The radical employees rejected this more and tried everything possible to derail the process.

With the given constraints the vehicles were transferred to company X and a formal contract drawn up which would be renewable annually.

7.5.4 Problem Areas

Business skills training had to be given to the employee creating entrepreneurial culture.

Lack of co-ordination and control had to be overcome

Elevating victimisation from fellow employees was a problem

Jealousies from other employees instigating the rest of the workforce was threatened

Resistance from the radical unionist was more prevalent.

7.5.5 Benefits Achieved

The major benefit was achieved by the employee of company X who gets a fixed cost equal to his weekly pay and earns extra money for work carried out. His monthly turnover is now reaching R16000. He has managed to payoff three transport vehicles within the space of nine months and now has an asset for developing his business.

From an organisations perspective, the overhead cost for the employee and the operating cost of the vehicles was saved, but other costs were incurred as achieved above. The biggest saving was neutralising the now dominant unions who rejected every move to one who was subdued and toned down with the loss of it's militant chairman. This was worth more than financial savings as work floor interruptions were minimised. The complaints in the despatch department have been reduced from an average of 10/week to nil.

7.6 IMPLICATIONS FOR IMPLEMENTATION

The problems were solved in the short term but after a few months it resurrected itself due to a lack of control over company X who was at times to complacent or lazy to carryout the requirements of the company. The attitude of 'I am my position' became his philosophy and building his empire was seen as priority above the needs of the company. Delays in posting and banking occurred as his earning for this was minimal compared to delivering heavy goods. The cost of transport was beginning to be higher than before.

Company X was rejected by his fellow family and unions members and seen to be a sell out. A lack of trust was encountered due to the unions not being involved in the negotiations. During the annual shutdown company X had no source of income as his business was dependent on Howden Air. The business has stagnated due to a lack of long-term vision of the employee.

As the primary objective was to enhance customer service the premature implementation of this project can be seen as being detrimental to achieving this, hence the long term sustain ability of both company X and Howden Air cannot be guaranteed given the implications discussed above. This thesis presents the argument that the culture has to be conducive to implementing a project of this nature.

By studying the case studies there is major differences which took place at the two companies which resulted in Masakane being successful and Company X not assured of success at this point in time.

The differences can be seen as follows:-

- Open frank consultation
- Full participation by all employees including unions
- Full autonomy to the operating unit
- Continuous education and training
- Empowerment as an ongoing process
- Strong communication and co-ordination
- Strong leadership and developed business skills of the managing partner
- A shared common vision of all the shareholders
- Multi-skilling and cross functional teamwork
- Continuous learning as a pre-requisite to success was set as an objective.

The needs of both employees and the Holding Company was predetermined and achieved. The reverse can be said to be true for Company X.

7.7 CONCLUSION

Imbedded in the principles of the Internal Markets Model are the concepts of shared responsibility and decentralisation of power. Coupled with this the advancement of the business world in South Africa is way beyond the machine age of the past.

Problem solving has become far to complex for individuals to make meaningful decisions in isolation. The learning organisation as suggested by Senge and the concept of principle centered leadership is becoming essential if we are to survive in the long run. The changes suggested in this chapter are no different to the broader vision of the Group, what is lacking at this stage is an understanding of the need to overcome the learning disability, and co-ordinating the changes to work in harmony with each other.

As the course has taught me, we need to move from analysis to synthesis, this means taking the problems and understanding the effects they have on each other. In the development of my hypothesis I argue the need to change the culture of the organisation and raise the level of maturity of its individuals. When one looks at the case studies under review I draw the conclusion that the argument is one which can be supported.

Given the philosophy of the group and the current situation in South Africa the Theoretical Predication can be said to be very much in line with the way in which Masakane has progressed. The major impact is going to be the way in which management facilitates the changes and entrenching a new culture which is conducive to continuous learning.

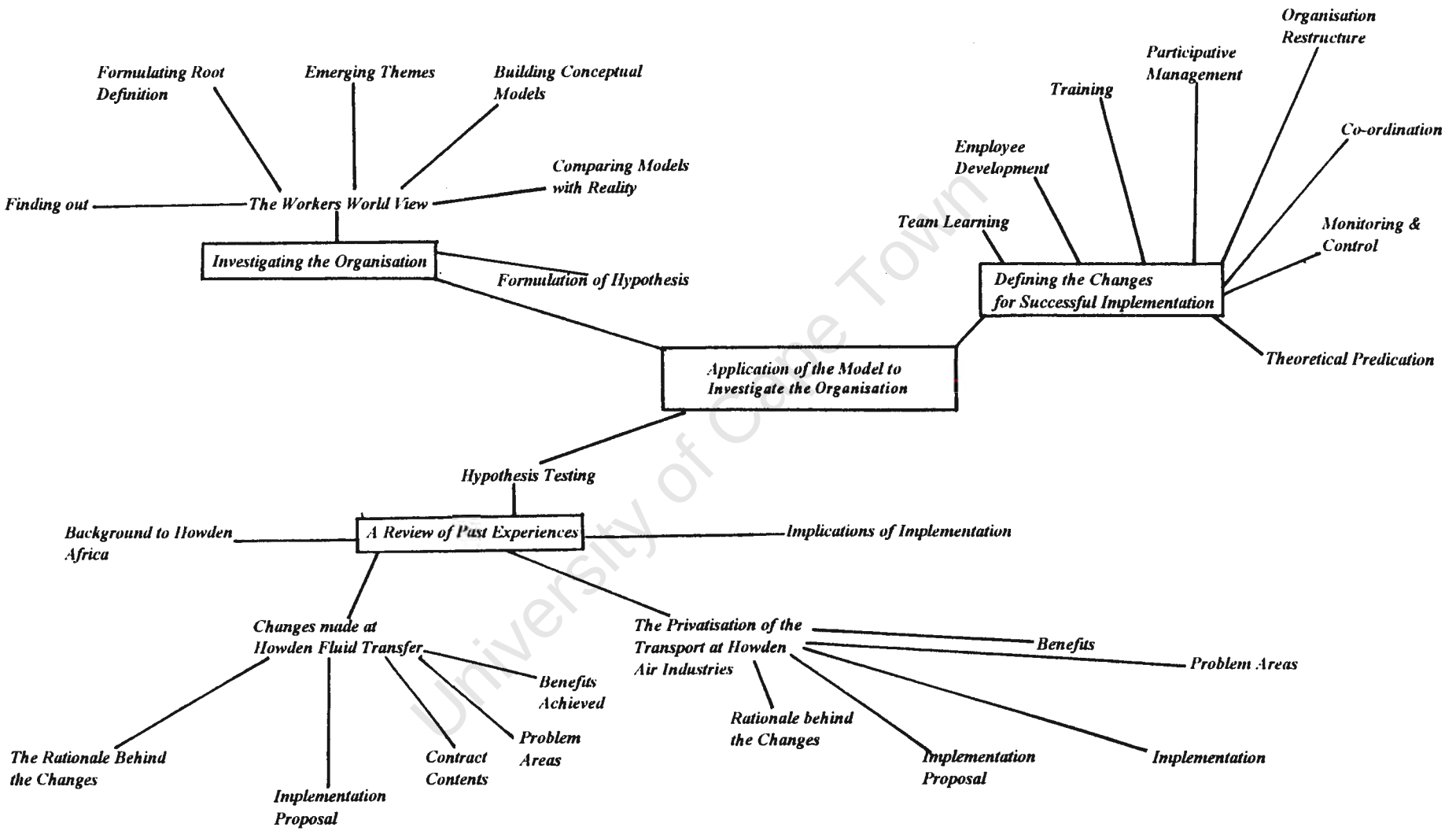


Fig. 10A Overview of the Application of the Framework to Investigate the Company

PART 4

CHAPTER 8

IMPLEMENTATION OF THE INTERNAL MARKETS MODEL AT HOWDEN AIR INDUSTRIES

PRACTICAL TEST (STAGE 7)

8. IMPLEMENTATION

8.1 INTRODUCTION

Part 3 has focused primarily on identifying the changes which would be required to successfully overcome the learning disability and for implementing the Internal Free Markets Model within Howden Air Industries. Part 4 will focus on highlighting the actual changes made through the implementation of the internal markets model within the organisation, both from a philosophical perspective, which are the soft issues, and secondly, on hard core developments which involved processes, structures and people. The chapter is concluded with a summary on the formation of small business units, where the pressure vessel departments and other functions and departments were semi-privatised with profit sharing for all employees. The changes proposed have two clear objectives, one being to change the culture within the organisation to one which enhances continuous learning and individual development, and secondly, by creating a learning organisation, enhancing the individuals' skills and understanding in team work, participation and empowerment.

Although the focus of the internal markets model is one which centres around the individual in contributing to the overall success of the larger organisation, the essential feature in creating the corporate culture conducive to team work is leadership. The major difference when comparing it to traditional leadership is the fact that leaders have to be established at all levels in the company. The time of the Chief Executive Officer managing from the top is outdated. The turbulent business world calls for leaders who are in touch with the cold face of customers, employees, competitors and suppliers.

8.2 FOSTERING THE LEADERSHIP PRINCIPLE

The traditional approach of the Managing Director being the leader has been changed to one where the management team is responsible for establishing direction for the organisation as a team who network together and contribute towards the overall improvements in the organisation through cross-functional communication. A strategic planning forum has been created

whereby members at all levels of the organisation are allowed to input through their departmental managers. This has created a shared vision for the future with all working towards a common objective.

Although this concept is strongly advocated within the organisation, we would be foolish to believe that it is firmly entrenched. Politicising and fighting for positions are a common practice in corporate organisations. The aim of successfully achieving this objective is for the Managing Director to maintain a balance between organisational effectiveness and individual empowerment.

8.2.1 Creating the Team Learning Culture

The cornerstone in overcoming individualism is creating a culture of team learning. Traditionally, performance appraisals were used to determine how successful the individual was - either by displaying his excellence, or by being buddy-buddy with the boss. Today, company performance is a reflection on the ability of the team in guiding the organisation to success. Individual performance and achievement is a by-product of team performance and success. The appointment of the new Managing Director whose philosophy is one of practice rather than theory, has given a new dimension to the concept of teamwork.

Previously, a marketing plan was put together by the Marketing Director, today he heads the managing team in setting the future strategy for the company. His industrial psychology background has enhanced his management skills and complemented his people's skills in creating a team where individual energies are harmonised to create a commonality of direction all aligned to a pre-determined objective. The commonality of purpose, creates a shared vision and understanding of how we compliment each other's efforts. We try hard to sacrifice our own interest and image for the good of the larger organisation. The present state of the organisation has strongly encouraged this as working against each other was seen as further decline. Creating this shared vision has been seen as a necessary condition to empowering the individuals of the team. The critical part in creating team learning is to allow creativity across a broad spectrum. People must be made to feel a part of the process within the company, rather than just a number. This has been achieved by allowing individuals to contribute where decisions affect them directly.

8.2.2 Relinquishing Power

The levelling of the management structures has in many cases increased the work load of all managers. This has resulted in managers having to delegate more to their employees by creating task teams to perform certain tasks. Decisions are by and large exercised at a team

level with management focusing on more strategic issues than before. Whilst this is a process which will take years to perfect, the wheels have been set in motion with constructive confrontation being quite prevalent as teams begin to form. Because the managers have shared responsibility with employees, the lower levels see that team work is working, which enhances cross-functional interactions. The company is viewed more as a whole, rather than different departments in isolation. Although not explicit, a shift from narrow vision to broad thinking is being developed.

Having set a framework based on a philosophical foundation, a forum was established consisting of management, unions as well as supervisors, to discuss the way forward for Howden Air Industries. It was agreed upfront that to rush into implementation without giving due consideration to all the factors affecting the company at present would be disastrous. The general feeling was for a plan of action to be devised with implementation spread over a period of twelve to eighteen months. This section of the report will review the actual actions taken in implementing the internal markets model concepts within Howden Air Industries.

8.3 SETTING A FRAMEWORK FOR IMPLEMENTATION OF HARD ISSUES

At its first meeting, management expressed its concern about the need to improve the performance of the company if it were to sustain itself in the long run. It acknowledged that the present structures within the company needed to be reviewed to allow active participation at all levels in the organisation which must not only benefit the company, but also the employees. The important step which has to be taken is to improve the trust between management and the workforce. This must be seen as the foundation to make the company profitable and enhance its growth potential and employ more workers to become the market leader in its field. A by-product of this foundation has got to be improving productivity, delivering good customer service, maintaining stock control and improved overall conditions for all employees in the company. The internal markets model provided the means necessary to achieve these objectives.

The unions agreed on the management approach and offered its support in achieving these objectives. Their main aim was to further strengthen the management / union relationship, and to avoid further job losses at all costs, whilst fully supporting the principles of the internal markets model it viewed open communication at all times as the cornerstone to improving the trust and threatened to derail the process if this was not maintained throughout the life of the project.

8.3.1 Setting of Objectives

The following objectives were agreed upon and a task force appointed to head up the implementation of the internal markets model and to monitor and ensure the successful transformation. It consists mainly of six categories as follows:

- structure
- incentives
- performance measurements
- employee development and training
- participative management
- co-ordination

8.3.2 Structure

The more autocratic form of management would be replaced by the team approach with active participation encouraged at all levels. A team leader would be elected to replace the supervisors who many believed lack initiative and training in those positions. The team leader concept must be on a rotational basis of 6 - 12 months to ensure training and growth throughout the team. As the role of the team leader would be one of co-ordination rather than managing, it was agreed not to compensate such members of the team more than their normal weekly wage. True empowerment for all members would be essential for the success of the transformation. As an interim measure central control would be vested with the departmental manager whose role will include the training and guidance of all the teams to meet the objectives of the larger organisation. The team would be responsible for setting itself objectives and a broad base for the team leader to perform his tasks. The prime objective of the team would be to create a strong team which allows cross-functional communication within its ranks and move away from a task base to a multi-skilled based workforce.

8.4 THE DIFFERENT PARTS

The first step in introducing the internal free markets would be to clearly define the present structure as it stands. Presently, the organisation is based on a typical hierarchical structure with the following parts:

- Senior Management
- Middle Management
- First Line Management

•Workforce

The various departments presently consist of operations, sales and marketing, finance and accounting, human resources and administration.

8.4.1 The Re-Defined Parts

It was agreed that the re-organisation of the organisation would be done in the following way:

1. Factory

This must be created into a free standing unit with full autonomy given to the present management team. The role of the factory would be to manufacture components required for the manufacturing of the end-product which is sold. The factory's number one customer would be the Assembly department. In addition to the present manufacturing of components for assembly, the factory will have access to other business, by selling its services to other companies. They will sell components to the Assembly Department at a market-related price.

2. Assembly Factory

The Assembly Departments, like the factory, would be created into a free-standing unit. Its role would be to purchase components for the manufacture of the end-product, required by the market. They will use the factory as its main source of supply, but will also have the freedom to purchase from cheaper sources of supply. The main customers for this unit will be the Sales Unit.

3. Sales Units

The sales department can be redesigned to sell the best available product at the best possible price. For this to be effective, they must be given total autonomy and freedom to shop around for the best deal available. They would treat the factory and assembly as individual units and support as far as possible. Achieving the overall objective must be the key to improving sales by aligning the vision of individuals to that of the team.

4. Service Units

The remaining functions of the organisation, viz, human resources, finance and accounting, administration and quality control would continue to operate in the same way as before. The redefined role should take effect in phase two of the implementation of the internal markets model.

Factory

The factory could be subdivided into smaller operating units, consisting of the following:

•Press-Shop

- Coil Department
- Attenuator Manufacturing
- Ventline Component Production
- Mez Manufacturing
- Centrifugal Fan Manufacturing
- Axial Fan Manufacturing
- Maintenance and Engineering Services
- Pressure Vessels

8.4.2 **The Roles of the Different Departments**

Press Shop

The press shop would consist of the material preparation for all other departments. It would include the CNC machine centres, press machines and sheet metal manufacturing. This unit will purchase raw materials and sell its products to other units in the organisation. Orders would be placed on the press shop unit by other units. They will not be limited to work for outsiders as long as they do not have a conflict with Howden Air Industries' core business.

Coil Department

This unit is responsible for the manufacture of coils required by assembly and sales. They would place orders on the press shop for components required and purchase other materials from outside suppliers. This unit would include:

- Tube Preparation
- Fin Manufacturing
- Coil Assembly
- Coil Welding and Testing

Because of its technical requirements, this unit will be limited to manufacture internal only. Outside work will not be permitted, as the liability will be too great in the event of a claim against them.

Attenuator Manufacturing

This unit would include:

- Fan Filter Units
- Round and Square Silencers

The materials required to manufacture the above products would be purchased from the press shop unit at market-related prices. Attenuators would be manufactured and sold to the sales team. The unit, however, has the power to sell these units to outside customers as well

as internal customers. The level of competition from this unit is going to be essential, as they manufacture a completed unit.

Ventline Component Manufacturing

This unit would purchase components from the press shop and manufacture components required for assembly diffusers. It would be the sole supplier to the assembly unit of these components.

Mez Manufacturing

This would be a one-man operation manufacturing Mez flanges from materials purchased directly from the supplier. Its main role would be to sell the flanges to the sales department and be self-supporting.

Centrifugal Fan Manufacturing

This unit would include the manufacture of fans for the use in Yucon product line and other customers would include sales and external customers. All components are outsourced as it includes motors, semi-complete fans which are imported, belts, pulleys and a cubic frame.

Axial Fan Manufacturing

The main role of this unit would be to supply the components used in the assembly of various axial fans. The various components would include arms, casings, welded platforms, mating flanges and bolt on platforms.

Engineering and Maintenance

This department will be responsible for the maintenance within the various units. It will sell its services to the units on an hourly basis for daily maintenance and charge for any tooling requirements on a job-by-job basis. In addition to internal customers, they could sell their services to external customers.

Pressure Vessels

This department will manufacture all types of pressure vessels to specification from Engineering. The material will be supplied by stores and all components manufactured within the department. They would only manufacture to customer requirements which are specified by sales. This department will also be limited to internal trading only to circumvent any possible claim against it.

Assembly Units

The Assembly Unit can be divided into different product ranges, forming three individually operating units. This would consist of the following:

•Luft Assembly Unit

•Yucon Assembly Unit

•Ventline Assembly Unit

These units would all operate on the same principle. Their main source of supply would be the various units within the factory. They would purchase components from the factory units for the final assembly of orders which they receive from sales, who is their number one customer. These units, however, will have the opportunity to purchase and sell goods externally if the market allows it to remain competitive. Its main role, however, would be to manufacture products at competitive prices for the sales units.

Sales Team

The National Sales Team can be broken down into privately run units. It could consist of the following units:

•Cape Town Sales

•Gauteng Sales

•Durban Sales

•Eastern Cape Sales

These units could all "go it alone", by creating its own, internally cross-functional teams. They would purchase independently from Manufacturing Units within the organisation. Its main role would be to increase market share to ensure that the other units in the organisation remain viable. They would be instrumental in the long-term viability of the organisation.

Service Units

The service units in the organisation would include:

•Human Resources

•Finance and Accounting

•Quality Control

•Administration

These units would primarily function on a consultancy basis. All units would operate as individual profit-centres, offering functional support to the various units. They would sell their services at an agreed price to other units and external customers. A central allocation could be paid monthly by all units to pay for standard day-to-day services such as receptionist, secretarial work, first aid etc.

8.5 INCENTIVES

The overall objective is to sustain long-term viability for the company and enhance the earning potential of all its employees at a joint sitting. It was agreed that the incentives will be based on output and quality as a starting point, as these were easily defined and measurable on a weekly basis. This would give rise to improvements as the will to out-perform the plan will be stimulated by the R150,00 productivity bonus which is incremental by R25,00 for every R100,000 above target. Although each cell will be monitored individually, the interaction between cells will be a key factor in improving on a continuous basis, hence peer pressure within and between cells will be a foundation for success. This lead to an agreement that in its transition, everyone should be rewarded equally, based on company performance as one cell would depend on the other for improved output.

The cost of quality will be considered in determining net output, meaning that any rework and scrap would be deducted off the achieved output to have a net output determined. Other factors influencing output such as absenteeism would also be measured and a penalty system introduced for those exceeding the limit. In addition to the productivity bonus, a floating trophy will be awarded to the cell which is the best performer for the month. These incentives were agreed on as a starting point to implementation which has to be reviewed further down the line.

8.5.1 Performance Measurements

For any incentives to be objective, it would be imperative for it to be backed by a performance measurement system which is meaningful. The objectives set must be measurable and also within the reach of the cells and the company. It would be important to set targets which are going to be achieved as setting of unrealistic goals will lead to demotivation and eventual failure of the project. The following targets were agreed upon:

Description	Target
Absenteeism	3%
Machine Downtime	5%
Material Productivity	95%
Quality Cost of Rectification	2%
Safety and Housekeeping	90%
Production Time vs Lost Time	75%
Planned Output vs Achieved Output	100%

Apart from safety and housekeeping, which will be determined by the committee, all other targets are clearly defined and easily measured using the present reporting mechanism which the company has at its disposal. Any overall improvements will result in a bonus for all and any individual effort in improving the process or productivity for the good of the larger organisation will be rewarded accordingly.

8.5.2 Employee Development and Training

The disintegration of the organisation into various cells will lead to a more focused approach to individuals' daily activities. In order to get specific needs out to specific employees, it was decided to institute an internal training program which would include basic business principles, team work, planning, quality and the various practical skills needed to carry out their functions. The management of Howden has taken it upon themselves to train individuals on an ongoing basis, which would include personal coaching, in areas such as problem solving techniques, in order to create an understanding of seeing beyond our routine activities and to fully understand the causes and effects of the decision making process. Where internal expertise is lacking, such as a tax consultant, the company would make available the funds to sponsor such requirements.

On a technical level, the engineering manager and his team will be responsible to instil within all employees from administration to the shop floor, the questioning culture. This is an attempt to create an awareness of seeking to always improve the process and techniques as fast as possible. Whilst the shop floor is technically sound, their skills will be refined as shop floor training will focus on the finer details. It was agreed that all employees gaining new skills and who utilise those skills in improving the overall productivity within the company will be rewarded accordingly. The main focus of this training unit must be to empower all participating employees who achieve the overall objectives of the company, as has been stated in my earlier argument, that without a workforce which prides itself in a culture conducive to learning, the success of this project will be limited in many aspects.

8.5.3 Participative Management

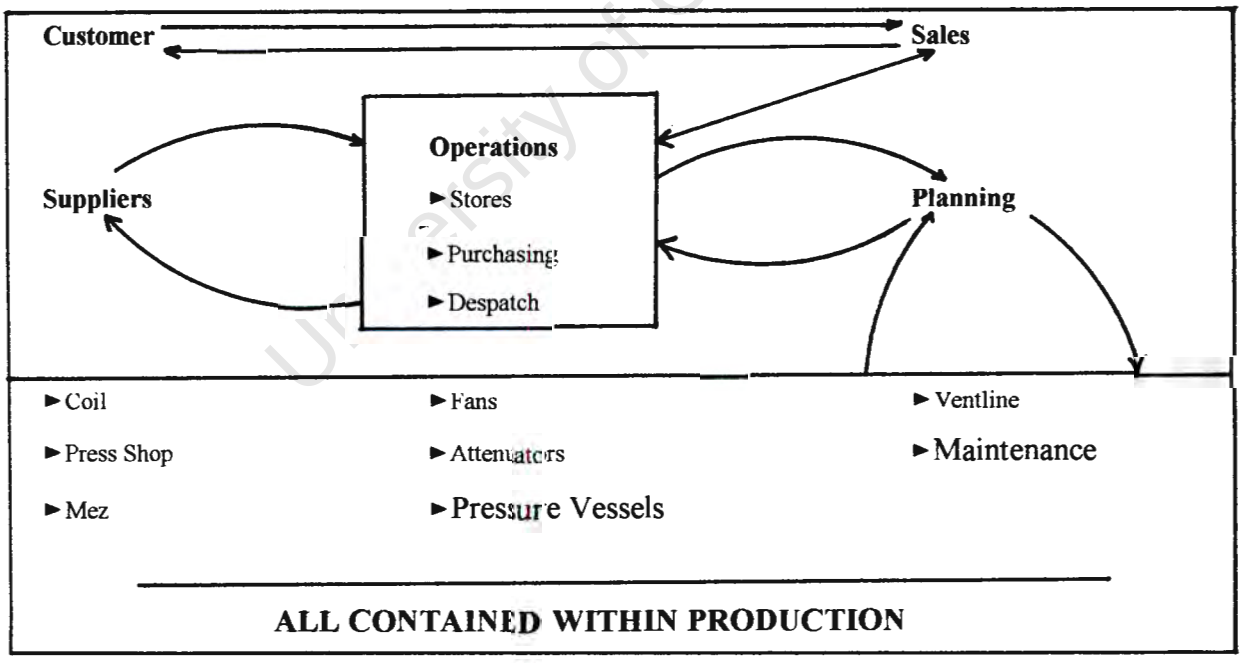
The level of maturity of senior management has made facilitation of this process rather simple. Never before have I seen so much interaction between the shop floor and management. The setting up of this forum to implement the internal markets model was built on the team approach. As has always been the case in Howden Africa, the sweeper or tea lady has direct access to the managing director if he/she has followed the communication channels and not

been satisfied. This philosophy has now been entrenched in the new labour law and the challenge for Howden is to develop it to be a way of life within the company.

More specifically, it was agreed that daily review meetings will be held at shop floor level to discuss daily problems needing attention. In addition to shop floor reviews, the management team will have one too, and assist the shop floor in solving difficult problems. As we develop more and more, power will be decentralised, but at this stage of the fight, it would be imperative to maintain sound control if the successful objectives are to be met. We can not burden inexperienced individuals with responsibilities way above their levels of competence. The monthly industrial relations meeting must now move to a new level of thinking and move from a moaning session to a problem solving / strategy meeting, where the relationship can be built on a foundation of trust.

8.5.4 Co-ordination

To improve this very critical component, it was agreed to employ an additional employee in the planning department. The levels of co-ordination would be focused at three levels. Whilst focusing on three levels, the interaction will be cross-functional and based on the following model:



Co-ordination Network within Howden Air Industries Figure 11

The interaction is represented by the arrows which signify the flow of communication between the various stakeholders. Sales functioning at recursion level 0 is responsible for gathering information from the customer as well as feeding back on progress of customer orders. Operations will obtain information from sales, suppliers and planning and be the core function for gathering and forwarding information to the relevant departments. The planning

function will drive co-ordination at shop floor level and feed information to operations level. The key to all these functions is to ensure cross-functional communication between the different departments.

8.6 SUMMARY

The implementation, although spread out over a period of time, was monitored with different cells progressing at different levels of maturity. In many instances, a lot of development is still required for any degree of success to be claimed, on the other hand, others have progressed with much success resulting in true empowerment. The following will highlight the success of Tempco Engineering formally the pressure vessel department within Howden Air Production. The intention is to develop all the cells to the same level as Tempco with the negotiations with other cells at various stages. The following is a summary of the agreement between Howden Air and Tempco Engineering, later on referred to as the Corporation.

8.7 THE DEVELOPMENT OF THE PRESSURE VESSEL DEPARTMENT

The manufacturing of pressure vessels is a more skilful trade than most other operations within Howden Air Industries. Being a labour-intensive process where skilled artisans are used, has facilitated the raised level of business skills within this department. Coming from a more productive environment where a culture of high output with exceptional standards were the order of the day has motivated these employees to buy into the privatisation concept without hesitation. The commitment from management to employee empowerment with financial gain also motivated these employees to prove their capabilities at all costs. Having committed themselves to the changes has now led to partial privatisation where all employees within the department have formed a registered company that now sub-contracts its services to Howden Air.

8.7.1 Membership of Tempco

- Each member will have a 12,5% interest in the Corporation.
- Shares in the company would be paid for at an initial fixed price with the balance being paid off on a monthly basis.
- As members of Tempco, they have all resigned as employees of Howden.
- Control and management of the Corporation will vest in all members.
- The day to day management will be carried out on behalf of the members by a managing member who has no superior authority.

- Any two members will be entitled to call a special meeting.
- Other than special meetings, all other meetings will be scheduled to discuss relevant issues by the whole Corporation.
- A quorum of 5 must be present for binding decisions to be taken.
- All resolutions must be represented by a majority of 75%. Where a dispute arises, Howden Air will be called on to mediate in order to settle the dispute.

8.7.2 **Undertakings by the Members**

It was recorded that, initially, and until otherwise agreed between the members, the specific business and objectives will be to acquire from Howden the business of the pressure vessel shop, and to carry on such business for the benefit of the Corporation and its members. It was recognised that the continued growth of the Corporation will be for the benefit of all members and accordingly, the members undertake at all times to act in their mutual interest and in the best interest of the Corporation. In particular, each member undertakes:

- Not directly or indirectly, to carry out any activity nor to permit any third party to carry out such activities which compete with the activities of the Corporation.
- Not to put any member in a position where a conflict of interest could arise between such a position and his position in the Corporation.
- To devote the full time and attention to the business and operations of the Corporation in order to maximise the profitability and growth of the Corporation.
- To utilise the infrastructure available to the Corporation - not only to render services to Howden, but to seek to expand the business - provided it is not in competition to Howden's requirements.
- To work for a fixed salary with increases agreed to by all members.
- To work any additional overtime without compensation in order to satisfy the needs of Howden Air Industries.

8.7.3 **Duration of this Agreement**

The agreement shall remain enforced for as long as the Corporation carries out its present business. The present members must hold majority shares to pursue its objectives. In the unlikely event of Howden closing down, the Corporation may continue in the business, but will not be limited by the terms and conditions of this agreement.

Furthermore, the agreement will be null and void for the following reasons:

Should either party:

- fail to make payments as per the agreement;
- fail to abide by any condition as laid out;
- suffer any legal judgement against any party;
- be placed under judicial management;
- compromise its conditions or attempt to do so.

8.7.4 **Undertaking by Howden**

Howden undertake to lease its present workshop to the Corporation at a rate not higher than the market related prices at the time. It will purchase the services of the Corporation in all its business and will encourage their sister company's to do likewise. Howden will not sub-contract any work which can be offered at the same rate by the Corporation. The amounts payable to the Corporation will be governed by Howden's price list, which is subject to review on an annual basis. As a start, Howden will purchase all materials required for production of goods and supply to the Corporation as and when required. All machinery will be leased to the Corporation for as long as the agreement is in place, at a fee of R750,00 per month which will be maintained by Howden, provided any repairs are as a result of fair wear and tear. The plant and machinery will, however, remain the property of Howden Air. Howden further endeavours to provide to the Corporation such working capital as may be required from time to time, subject to a maximum of R10 000, which will draw interest at the prime lending rate. All payments by Howden will be paid within seven days of invoice. Given its expertise, certain central services were agreed upon, which Howden can provide without much cost to itself. These would include:

- clinic services and first aid
- quality inspection and control
- administration, including salaries, accounting and secretarial work
- building maintenance
- security services
- group insurance

all members of the Corporation may remain on the Howden pension scheme and medical fund for the duration of this agreement

The above services will be charged as an annual fee as agreed annually by Howden, the Corporation and the auditors. On the accounting side, to safeguard the interest of the Corporation, an individual auditor will be obtained to scrutinise the books of the Corporation.

8.7.5 The Rationale Behind The Changes

As discussed earlier, the group's philosophy is based on the principles that true empowerment would be essential to sustain its business and ensure long-term viability.

In starting this project some 10 months ago, the intention was always to truly empower the individual by creating a mechanism where financial benefits are more than just a salary. In formulating my hypothesis up front, I strongly suggested that the success of the Internal Market Model will depend largely on the ability of the organisation in changing its culture and who is concerned with the developrnent of its employees. When one compares the progress of the individuals in Tempco Engineering to, for argument's sake, the coil department, the difference is like night and day. Although the organisation has adapted its culture throughout, the employees' progress has been much slower, hereby delaying the progress of implementation. With a total monopoly in the manufacture of pressure vessels in Cape Town, the need to increase output was becoming more and more important. Whilst it was possible to employ more people, the belief was that with successful implementation, productivity was most definitely going to increase, as the incentives were very lucrative through profit sharing as designed for Tempco Engineering.

8.7.6 Planned Benefits

It is strongly believed that the development of Tempco Engineering will lead to a stand alone business which is capable of sustaining itself in the long run. When one looks at its first operating month, the output has already been increased by some twenty five percent over the past year's average. If this performance can be sustained, the possibility of increased sales will be enhanced as lead times are reduced to meet very tight deadlines. I have no reason to believe that this scenario is not going to materialise. The spin-off of increased turnover will increase the labour force, which will ultimately lead to higher profitability for all members in the short term, and possible expansion in the long term. The most important achievement for the members of Tempco is the establishment of the Corporation where success is vested with them. Having now completed May and June 1997 on a sound note, the additional earnings retained by Tempco has totalled R38 000 for the first two months of trading , this represents a net profit of 10%.

8.8 FUTURE DEVELOPMENTS

The long-term strategy is to successfully develop all the individuals to have a say in running their departments effectively. The belief of Howden is that long-term sustainability will only

be assured if the employee becomes more involved in the day to day activities of the organisation and move away from being a number to being a partner in the business. Discussions are well on the way for similar ventures in other departments to set up small business units within Howden Air. As with most changes, fear is instilled in many individuals both from a comfort point of view, as well as the fear of failure. As was argued, the way to overcome this fear is to create the learning organisation, something which Howden Air is slowly but surely achieving.

The different levels of maturity are quite evident when one looks at the present state of the company. Backing my hypothesis developed in part 2 viz. of "changing the culture to one which facilitates continuous learning", it is clear that the employees of Tempco Engineering have, by and large, been successful in achieving this. The rest of the departments are somewhat behind, even though many are just about ready. Not all was joy and happiness as some departments have battled to adapt to this new way of thinking and are in serious need of re-evaluation. Using the factory as a case study, the following is an attempt to further highlight the need for the culture to be embedded prior to implementation.

8.8.1 The Press Shop

The development of the department has been fairly on par with that of Tempco Engineering. The major stumbling block in my opinion is the level of maturity of its employees. Having followed the same process, the desire to be self-sustaining in a larger organisation was not so great. What did however occur was the teamwork within the department as well as others interacting with it. This lead to smaller cells being eventually formed into a larger cell now known as sheet metal. Negotiations are well on the way to follow the same route as Tempco, albeit three months from now.

Maintenance and engineering services employees were not keen to follow this new way of managing and soon became victims of the system, with many opting for voluntary retrenchments. Not wanting to be outdone, the services of maintenance and engineering were subcontracted to an outside contractor who has subsequently sublet our toolroom and operates as an independent business unit within Howden Air's factory.

The Attenuators cell proved to be non-profitable and the skills were seriously lacking for a success to be realised. After serious consideration, it was decided both by management and the unions, that the best alternative would be to outsource this operation to an alternate manufacturer. This was done about three months ago without any job losses as the subcontractor had to start a new department using existing employees to manufacture our products.

Not only has the transformation been successful, but the results have been tremendous. After starting with a few quality problems which were soon overcome, the manufacturing lead times have been reduced from six weeks to two weeks. Needless to say, sales in this category have gone up substantially.

Ventline Manufacturing's employees' skills levels have led to a serious problem. This, coupled with out of date machinery and a lack of responsibility, on the part of the employees has led to the outsourcing of all the manufacturing processes. Although the transformation is still in progress, the discussion is well on track. Having sourced one of the best sheet metal press shops in Cape Town, we have been given hope for the revitalising of the Ventline product.

The manufacturing process in the coil production is limited in skills and individual development. The outdated methods have also cost the company a loss of sales through the international markets which are vibrant in the new South Africa. The need to grow the product is enormous, due to the fact that it is the only manufacturer of its kind in the southern part of South Africa, including Western and Eastern Cape and up as far as Namibia. Capital injection is seriously needed if future product development can be achieved. Not being core to Howden's fan industry, the possibility of selling off this part of the business is quite likely. Needless to say, the lack of increased productivity has played a major role in management's plans to sell. Had the maturity and skills level been compatible with the philosophy of the internal markets, the possibility of future growth would have been achieved internally.

8.8.2 The Future of Howden Air Industries

Like most corporate giants, downscaling and outsourcing has become the focus of improving organisational effectiveness to ensure long-term sustainability. We at Howden believe in this philosophy and our project has given us insight into many facets of inspiring our organisations from all angles.

The way forward for Howden after implementing its outsourcing program is to focus on its core business which would include marketing, assembly and production of core components for its fan and diffuser requirements. From a fragmented organisation focusing on too many products and lines, we will now focus on supplier management to satisfy the needs of assembly whose main products will be fans and diffusers. The new Howden Air factory will consist of three cells viz. fan assembly, diffuser assembly and manufacturing as its core and ably supported by stores, engineering and finance.

8.8.3 Planned Results

The re-organisation has both negative and positive effects. Looking at Tempco Engineering, the immediate benefits have been encouraging. Having operated as a separate business unit for just one month has led to an increase in productivity of about 25% with monthly turnover moving from R150 000 to R285 000. On time deliveries have gone up from 32% to 90%, scrap has come down from about 5% to 1% and a loss situation has been reversed to a net profit of 10% The individual performance of all employees has increased both from a commitment to Howden as well as to themselves and each other. If this is anything to go by the benefit to all other units are bound to be in the same vain. For Howden Air, the team approach is strongly coming to the fore as the need to succeed is becoming more than just a luxury, but more of a fight for survival. The major changes taking place are placing an enormous responsibility on all employees' shoulders and the will to succeed is exceptionally high. The immediate target for Howden Air would be to end the next financial year at a break-even with a return to profitability during 98/99 financial year. All things being equal, and the planned changes implemented successfully, this objective would most definitely be a reality.

8.8.4 Implications of Implementing the Process

As was discussed earlier in the report change within organisations are often faced with resistance from those less likely to benefit. The strategic importance of this project is that the call for democratisation in the new South Africa will leave the unions in a very powerful position. The present form of management would be a prime target for any hard-line unionist. The implementation of the Internal Markets Model however facilitates the decentralisation of Power by empowering all levels of the organisation. Howden Africa's belief is that with responsibility must go rewards which leads to semi private business units where employees are participating stakeholders in the business. This negates the need for unions as the employees now provide the answers for their own problems.

Mass privatisation in an uncontrolled organisation could lead to a rapid decline in business. The uncertainty of those participating in such projects is of utmost importance as the rewards will only be seen later on. Short term results are often demoralising as the setting up of new structures could lead to job losses and in turn increase the workload of others. By decentralising power into the hands of the workers would mean that the formally power driven manager would now have his position at stake. Often managers who fear the loss of power are the very ones who cannot handle it. For this reason again the culture would have to be entrenched in the company if success is to be achieved.

Internal conflict can result in tension between the unions and different cells as the will to succeed is superseded by a greed for financial gain. The balance between the two is something which has to be closely monitored if teamwork is to prevail. A clearly defined set of measurable indicators would be imperative to monitor the progress of each cell to maintain fairness and consistency throughout.

The success of the company is now vested in the hands of the workers which means that management would merely facilitate the process rather then manager the process. Here we must be careful as inexperience can soon result in failure. It would be wise to have a joint decision making body to ensure long-term success as an interim measure, as development of individuals will not take place overnight.

The description of Tempco Engineering however justifies the argument presented in the hypothesis viz the culture and maturity of both employee and employer is essential to the success of the project.

8.9 CONCLUSION

Many organisations are continually going through changes in the hope of transforming their company into profitable ones. Human nature has it that change is always difficult irrespective of the consequences but more so when the effects are as far reaching as those experienced during the implementation of the internal markets model at Howden. Often employees settle into a comfort zone and when changes are implemented, opposition and rejection is the best line of defence.

Having worked hard at the Soft Issues the management and workforce have moved forward in setting the platform to turn the company around. A lot of hard work has gone into restructuring the business to focus on it's core activities which sometimes resulted in job losses. Fortunately this was kept to a minimum. This chapter explains broadly the actual implementation process of the IMM which was followed at Howden Air. As was argued in the hypothesis the changes defined earlier are essential if long-term sustainability is to be assured. Although the trend is in the right direction we would be fooling ourselves to believe that success can now be assured. What is required now is a continuous process of evaluating the progress and always explore ways of improving. I believe that a platform has been launched to further develop the company.

The privatisation of Tempco Engineering is an example of what hard work and commitment can achieve. As explained earlier, the difference between these employees and the rest was the level of maturity and education. This is in keeping with the Hypothesis developed earlier. I have no doubt that the planned success of both Tempco and Howden will be based on its ability to use every achievement as a stepping stone to the next level of effectiveness.
The success of Tempco engineering justifies the arguments raised in the description of the problem situation. When we refer to Part 1 we will see that Tempco have succeeded in:

- Transforming the hierarchy into an internal enterprise.
- Creating an economic infrastructure to guide decisions.
- Provide leadership to foster synergy.
- Enhance the sustainability of it's organisation.
- Provide empowerment at grass roots levels.

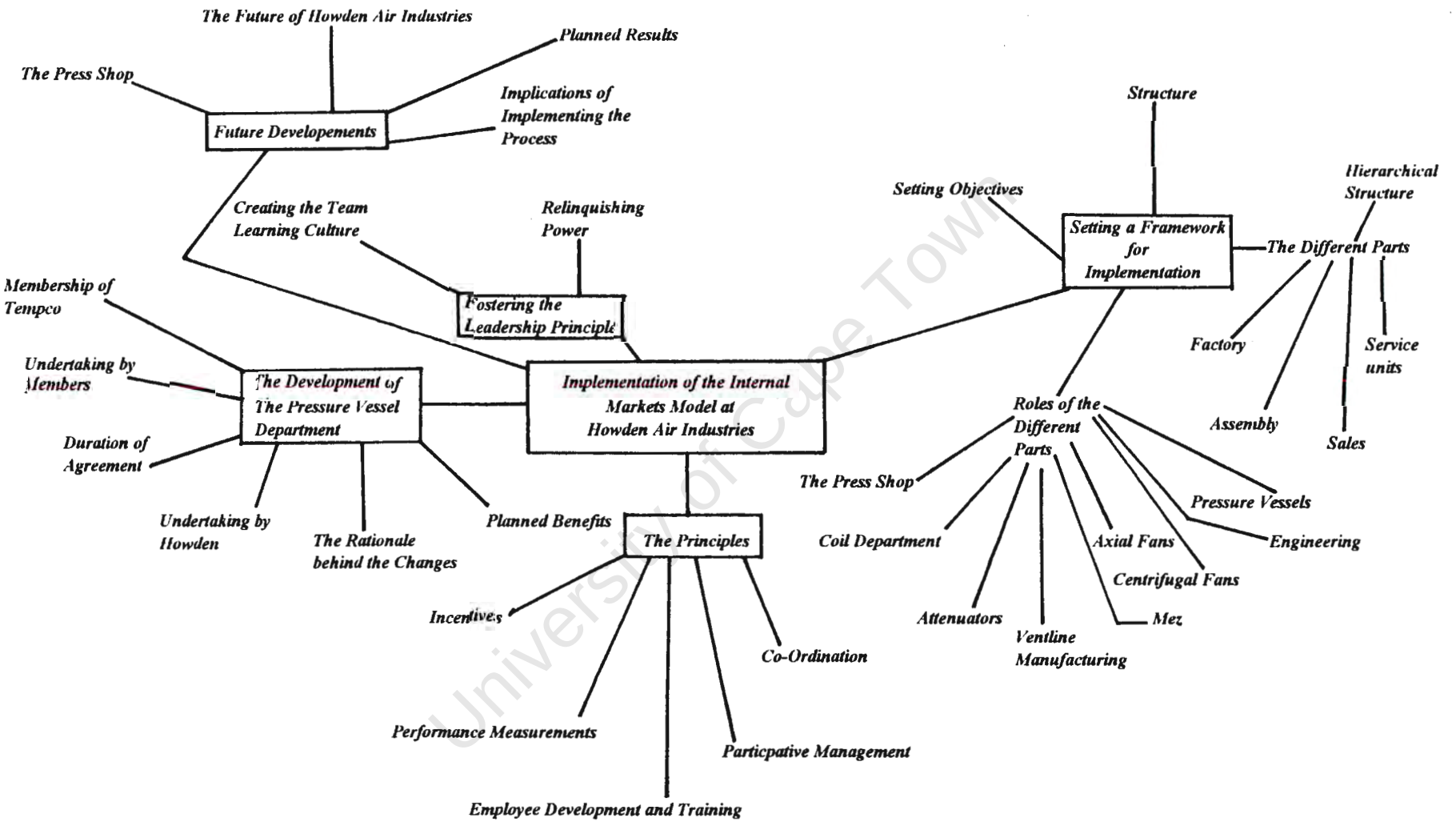


Fig. 11A Overview of the Implementation Process

PART 5

CHAPTER 9

REFLECTION

9. REFLECTION OF THE CONTENTS OF THE CASE STUDY

The reform in the country and the democratisation of the shopfloor is steam rolling ahead with a fundamental shift in management styles and philosophy unavoidable. The archaic methods of problem solving by crisis management and fire fighting have to be replaced by modern methods of inquiry. In part 1, the model which is presented highlights critical aspects of the management process of inquiry which I have adopted as a form of problem solving. I found the SCQARE of Prof Ryan particularly interesting in highlighting current events as they appear.

When we look back historically, many companies have fallen from grace due to a lack of innovation and keeping up to date with market trends. Looking back three years ago when the amalgamation of Howden Air Industries took place, it was at a time when big was better. The international trend on the other hand, is to move away from a centralised power base to that of a market driven base. The internal markets model facilitates this transformation which, if successful, could lead to true empowerment of all employees with capital gains for both the company and the workers. The transformation, however, has proven to be constant pressure from hardline unionist and political players within the company. Although the workforce is more or less unanimous in its views on the need for the internal markets concept, there is a split in its attitude towards management policy and actions with regards to this issue.

In analysing these world views, the use of soft systems methodology is useful in sweeping through a diverse range of world views held within the organisation. SSM allows the investigator the opportunity to be unbiased, whilst giving freedom to the interviewee to express his inner feelings without being prejudiced. Moreover, it allows many potential problems and requirements to surface, which if done in isolation may not have been achieved.

The timing of this project inadvertently coincides with the need for change in our country with special reference to the new Labour Bill which is a bone of contention. As in the past we have union / management struggles which eventually lead to failure. The internal market model, however, attempts to facilitate a process which we need to ensure our long-term sustainability. Yes, it would be true to say that employee maturity on the one hand and

management growth on the other are key elements in reaching a workable solution. Reflecting on the process at Howden Air, certain departments having been hungry and mature enough for success, have taken the opportunity and made a major input on productivity and profitability, both for the company and themselves. As was previously stated, the transformation process be it in politics, management or in everyday life, is a painful process which takes time to reap rewards. Howden Air Industries is a prime example of sitting of the threshold waiting to explode into a new era which will reap the rewards of the pain and suffering endured through this change process albeit slow and painful.

It would be true to say that many have suffered through stress of work load, job losses, reduction in pay and internal conflict, but at the end of the day, we will all be able to sit back and say it was worth it.

For me previously, the development of my thesis in tandem with this project has facilitated growth as a learner as well as a manager who now relies heavily on the learning model to present problem situations on a regular basis.

The biggest and most important question has got to be, *"Are we going to survive the onslaught and are the changes going to benefit us? Has the hypothesis been in keeping with the culture?"*

The answer can been determined using the following information which are the results of Tempco Engineering:

Month	Turnover	Orders On Hand	On Time Delivery	Gross Margin
July 96	423	388	32	26.3%
Aug 96	145	394	36	29.1%
Nov 96	136	373	36	28.3%
Dec96/Jan 97	260	415	62	30.0%
Feb 97	211	353	59	31.0%
March 97	214	314	68	31.9%
April 97	262	368	71	36.5%
May 97	289	234	90	38.8%

Looking at the above table gives the reader a clear indication of the benefits which have been achieved. The overall profitability has risen by some 12%, which in any business is exceptionally good. The above questions will be answered in more detail in Section 9.2.

9.1 REFLECTIONS ON THE LEARNING MODEL

Management research and problem solving historically have been processes of authoritarian approach where most managers looked at problems in isolation without considering the cause and effect relationship within the previously undefined problems. The development of the scientific learning model with systems thinking as a tool for inquiry has led me to a better understanding of the new defined problem being investigated. In this particular project, I was fortunate to be able to have results having commenced implementation. To have achieved any meaningful test, I felt it was important to have a practical test. To have predicted an outcome without some form of practical test may not have given the desired effect. Multiple perspectives, together with Soft System Methodology allowed me the opportunity to cut through many slices within the organisation and obtained meaningful contributions in conducting the interviews. The model thus has enforced a rigorous research process where the questions and situation continuously changes and only ends when you define the boundaries of the problem.

9.2 REFLECTING ON HYPOTHESIS

When I reflect on the theory started after investigation I can say with confidence that the hypothesis has proven to be correct. The analysis of the stages of the various departments clearly highlights the pro's and con's of this project. The important aspect in successful implementation was the win-win environment created. One would have to ask the questions raised in the hypothesis to get a clear understanding of its meanings.

1. Have we changed the culture?

Yes, although this is a long-term process, the beginning has proven to be successful due to the sincere efforts of senior management.

2. Have we created team learning?

Where success has been obtained, participation as well as team learning and problem solving have become the order of the day. Looking at the less successful departments allows me to further prove that my hypothesis is correct in that political conflict within these teams are still prevalent.

3. Has control been decentralised?

Where maturity of employees have warranted the shift of power, this has been done,

however in the lesser developed departments, central control has had to be maintained to ensure order within the organisation.

4. Have we been developed?

Without a shadow of doubt, even those who have not benefited financially, from an educational perspective the enrichment process was priceless.

Given the research which was conducted, I would not hesitate to recommend that long-term sustainability would be strongly enhanced by implementing similar projects in many other organisations.

9.3 THE RELEVANCE AND VALIDITY

In Chapter 1 the problem situation described at Howden Air is no different from what many organisations are presently going through in South Africa today. The emergence of the New South Africa and the pressures exerted on business by the unions calls for a shift in the old ways of managing to a new more dynamic form of management. The Internal Markets Model in many ways facilitates this new wave of management which has as its cornerstones the concepts of participative management.

Business decision making has not been easy in the past and promises to get more difficult in the future. For this reason I believe the Model of Inquiry will assist the manager in seeing things in a broad prospective. Systems thinking can also give the decision maker the tools necessary in making those decisions easier.

The overall investigation into Howden has been long overdue as can be seen from the results achieved. Some three years ago we were an ailing company on the brink of failure where autocratic management was the order of the day. Today we are moving into a new dispensation with a forum of joint decision making being established. The management team of which I am a part have moved in the direction of creating conditions for the lower levels to be more effective rather than dictating what has to be done.

The relationship between management and the shopfloor has improved drastically with the exception of one or two senior members whose biggest fear is the loss of power which has resulted in the protection of his territory. I believe that with the proposed changes being implemented we would have to monitor the progress of this company to fully justify the relevance of this report. Given the past results I do believe that the future looks a lot brighter than in the past and would suggest that true empowerment can only be reached with a

genuine commitment from all the stakeholders. This I believe Howden Air is successfully achieving.

9.4 PERSONAL DEVELOPMENT

When I look back three years to the start of the course, I anticipated coming out of the course a much richer human being, even though I battled upfront, the development as an individual and as a manager has been most rewarding. Only now can I really appreciate the challenges facing South African business management in general and the need to develop ourselves on a continuous basis. I would be foolish to think that this is the end, rather this must be seen as the beginning of the next phase of my development.

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APPENDIX

INVESTIGATING THE ORGANISATION (SEE CHAPTER 6)

Unions World View

Worker democratisation has long been overdue and the time has now come for power sharing to be implemented. The union views this as natural progression in their fight against management over many years of the anti-apartheid struggle. At this point in time the implementation at Howden Air Industries or any organisation who is battling to survive is seen as passing the buck. It is ironic that when profits are down the work force is encouraged to improve and the problems are all on the shop floor. When the company is profitable, management is viewed as brilliant and the work force still does not get the recognition. The thought of dumping problems on the work force is undermining the authority and position of the unions. Management has no answers to the many problems facing the company and the pressures being placed on them by the unions are becoming increasingly difficult, hence the need to neutralise the unions power base.

Although they agree with empowerment the risk has to be under controlled and favourable conditions. Do no off-load a sinking ship, why not fix it up, prove that it can work and then negotiate profit-sharing. The sooner management acknowledges that the power to dictate the pace lies in the hands of the unions and any attempt to undermine their authority will be met with severe confrontation.

Ultimately any form of productivity improvement will benefit the company much more than that of the workers. This is another attempt to manipulate the situation to the good of the company by again using the workers. They support empowerment but are not prepared to carry the responsibility and share the risk.

Supervisors World View

The success of the Internal Market Model will depend largely on the willingness of management to share its power and authority on the one hand and the level of maturity and readiness of the employees to accept this responsibility on the other. With the South African labour laws being changed it will be essential to address the imbalance of power within formerly autocratic organisations.

As in the political arena the work force is becoming more demanding. Running a company always seems to be an easy task when sitting on the opposite side of the fence. However if

the South African business world wants to remain competitive in this ever changing environment, innovations such as what this model suggests will be imperative. Before full empowerment it would be essential to educate and train the work force to accept this major responsibility.

Authoritarian rule has failed not only in government but also in large organisations. Complex problems were attempted to be sorted out with a top-down approach often with very little success. The Internal Market Model allows the organisation the opportunity to have total integration at all levels of the organisation which results in short feedback loops that make effective learning and adaptation possible. Incentives have to be given to the work force to improve the total efficiency of the organisation. Without this, productivity will never improve.

Conventional organisations lacked vision as they focused mainly on top management when rewards were due. The IMM suggest that the reward system be based on performance and risk carried with the responsibility. If this can be achieved it would satisfy both management and the work force as the organisation would gain by the efforts of a motivated team.

Workers World View against the IFMM

The support the Internal Free Markets Model has strongly been rejected by certain sectors of the workforce due to many promised benefits of the past not being realised as expected. The work force who are always being used by management are always called upon to assist the company but very little assistance is given to the worker when needed. Many promises of training and upliftment were made in the past but very little evidence of success has been noted. The only training which is evident is that of management being uplifted for their own good.

Yes we have seen many changes taking place within the organisation but nothing different to what has happened in the past or what is taking place in many other companies within the South African industry. In Howden Air new directors and managers have been appointed, restructuring has and is still taking place , retrenchments have occurred till recently and productivity has certainly not been improving by that much.

As suggested we feel strongly that the responsibility for ensuring the long term sustainability of any organisation lies with management. Sure we would like to play our part in securing our futures with the organisation but this can only be achieved if the conditions for strong co-ordination, communication and team work are successfully created by management. We believe that the implementation of the internal free markets will be premature as the

workforce is divided on these issues and lack the initiative to take the responsibility of such a major transformation. Empowerment without education can be as damaging to the company as bad management is.

Senior Management perspectives on the Internal Free Markets Model

The success of Howden Africa Holdings has been manifested in the belief that teamwork with all employees as vital components of any team being a core philosophy of the Board of Directors.

It would be true to say that it was not always possible in the past to fully utilise the expertise of the shop floor in the past dispensation but with the introduction of the new labour law it is going to be essential. Educating employees must not only be in improving the company, but more essentially the focus has and always must be on uplifting the employees to be better in their jobs and better citizens within their communities. This will automatically lead to a better improved company.

On the flip side of the coin we would like to see the teamwork at senior levels in the organisation developed so that leaders are born to take the company on the road to success. Any successful team has got to have a Captain who inspires and motivates it's members.

Together with the principles and philosophies of the Internal Markets Model we believe that success through improved productivity will be achieved. We mention productivity because any project with the organisation has got to have a strong focus on doing things both efficiently and more effectively. It would be futile to believe that we would prescribe to anything that does not benefit the total organisation as this is why we are here "That is, to stay in business.'

The new South Africa is affording us many opportunities for developing our country, our communities, our organisations as well as our people. We see the application and implementation of the internal markets model as a tool for engineering these benefits which will be essential to our success.

The apartheid era has disadvantaged many people in all walks of life. This has resulted in many problems which has impacted on the South African economy adversely. It is now the time to move forward and practice democracy at all levels of society whether it be in business or in the political arena. Empowerment through the use of models such as the internal markets is seen as a natural progression in the development of business and strengthening the South African economy.

Autocratic management has failed dismally in most organisations. The business world is moving so rapidly and any organisation hoping to be successful will have to be innovative in it's approach to change management. The demands placed on business by the unions and the expectations raised by government has left business very little choice but to adapt it's autocratic management styles to one of participation and power sharing through the upliftment of all the people in South Africa.

Unions World View

C	=	Customer	Customers, Howden Africa
A	=	Actor	Unions, work force, management
T	=	Transformation	Advantaged powerful unions Vs Unprofitable company Disadvantaged powerless unions Profitable company
W	=	World View	The internal markets models is a means to undermine the unions for the good of the company
O	=	Owners	Howden Africa Corporation
E	=	Environment	Unions, competition, undisciplined work force

Root Definition 2

The internal markets model is a system owned by Howden, operated by the workers and management to undermine the authority of the unions through devious and poor management practices.

Supervisors World View

C	=	Customer	Workers, company
A	=	Actor	Workforce, management
T	=	Transformation	Hierarchical organisations Vs Decentralised power sharing organisation
W	=	World View	With the new dispensation power sharing and is essential for long term viability
O	=	Owners	Howden Africa Corporation
E	=	Environment	Unions, competition, undisciplined work force

Root Definition 3

The internal markets model is a system owned by Howden Africa Corporation which enables and facilitates power sharing and empowerment by decentralising power for the good of all given the constraints of the market place.

Workers World View Against the IFMM

C = Workforce, Howden Air Industries

A = Workforce, management

T = Unsuccessfully managed organisation - successful organisation based on principles of co-ordination, communication, teamwork.

W = The responsibility for transforming and creating conditions for the organisation lies with management

O = Howden Africa Holdings

E = Lack of education and training

Conditions are unfavorable at this point in time.

Root Definition 4

The internal markets model is a system owned by management (HGSA), operated by the work force which could successfully transform the organisation if the constraints of education and training are overcome by management who must create the necessary conditions prior to implementation.

Senior Management's World View

C = Company, employees

A = Workforce, management

T = Disadvantaged employees to empowered employees

Loss leaders profitable company ensuring long term sustainability

W = The implementation of the internal free markets is a natural progression of business to empower all employees for the good of the South African economy.

O = Howden Africa Holdings

E = Environment

Autocratic management styles. South African economic decline

Root Definition 5

The internal markets is a system operated by the employees for empowering all employees by decentralising power so that the company can contribute towards the upliftment of the South African economy. Given the constraints of a once autocratic management style.

Communication

Poor or no communication is one of the major problems existing in industry today. The cause of almost all relationship difficulties is rooted in conflicting or ambiguous expectations around roles and goals. Irrespective of the question being asked, the focus has got to be centred around good communication. We have seen in the past the effects of poor communication in business which leads to total confusion, misunderstanding, disappointment and withdrawals of trust.

Many expectations are implicit. They are seldom explicitly expressed or announced but often are raised in various situations. Negotiations between management and the unions can have many ambiguous statements which if not understood could lead to the trust gap widening between employees and management.

Building sound relationships hinges strongly on having clearer and explicit expectations upfront. This takes an investment of time and effort upfront, but it saves huge amounts of time down the road. When expectations are not clear and shared, people begin to become emotionally involved and simple misunderstandings become compounded, turning into personality clashes and communication breakdowns.

Communication is a pre-requisite to problem solving and a fundamental skill in life. We have to acknowledge that everyone has a role to fulfil within the organisation and must be given the vehicle to voice their opinions. One on one discussions to work out a win-win agreement and accountability process are keys to effective organisational communication, along with staff meetings when needed. Employee suggestion systems are good ways of rewarding good ideas that result in benefits to the company.

Using the following CATWOE a root definition can thus be formulated.

C	=	Customer	All employees
A	=	Actor	Management
T	=	Transformation	Employees without knowledge and understanding Employees with knowledge and understanding
W	=	World View	Two way communication will enhance joint problem solving within the organisation
O	=	Owners	Management
E	=	Environment	Ability to understand information. Poor communicators constraints

Root Definition

Communication is a system for disseminating information within the company to enhance understanding and knowledge given the constraints of poor communication.

Empowerment

Empowerment has certainly become the buzz word in South Africa today, the new constitution and the new labour relations act has a strong focus on the previously autocratic rules within industry. Unions and workers are more aware of these needs which are becoming a necessity to building sound business relationships.

A pre-requisite for successful empowerment has got to be trust. If you do not trust the people with whom you work, then managers normally use control rather than empowerment. When a relationship of trust exists and the organisation is aligned in it's objectives where everything serves to help the individuals be productive and effective then empowerment becomes a natural existence.

Empowerment is a process of allowing all levels of the organisation to make personal contributions toward the running of the company, which many believe to be the highest level of human motivation. It views people as the most valuable asset, capable of immense achievement and not a victim limited by conditions set by management.

Empowerment would require training and development programs which evolve from the company's vision and principles. It should empower employees to soar and step forward being guided more by imagination than by memory and ultimately reach beyond their fears and past failures. The ultimate culture which must exist within organisations hoping to successfully empower it's employees is one where the attitude is that there is plenty for everyone to share and the more you share the more you receive. We must develop people who are not threatened by the success of others as this normally leads to power struggles and personality clashes.

The Root Definition can now be formulated using the CATWOE as follows:

C	=	Customer	Employees
A	=	Actor	Management
T	=	Transformation	Oppressed employees : Empowered employees
W	=	World View	Empowerment is essential in today's demanding world to allow individuals to explore their talents and skills
O	=	Owners	Management
E	=	Environment	Lack of trust, fear, loss of power by management

Root Definition 8

Empowerment is a system for developing individuals for the good of the company given the constraints placed on the organisation due to a lack of trust and fear by management.

Teamwork

The demands upon us are constantly increasing, tasks become more complex and timing and co-ordination become more and more important. The only way to really be successful is through collaboration and through successful team efforts.

Individuals may work extremely hard but their efforts do not efficiently translate to team effort. By contrast when a team becomes aligned a commonality of direction emerges and individuals energies harmonise. In fact a synergy develops where common purpose shared vision and understanding complement each others efforts as a cornerstone of joint efforts. Individuals should not be seen to sacrifice their personal interest to the larger team vision, rather the shared vision becomes an extension of their personal visions.

Individualism in any organisation is a sign of fear as those people try to build empires around them. They forget that their actions impact in someway or another on the larger organisation.

Teamwork has a spiral effect where employees at a lower level will follow the actions of it's leaders. In companies if the management team pull together and lead the company based on ethics and sound business principles the effect on the shop floor can only be positive.

Using the following a CATWOE can thus be developed as follows:-

C	=	Customer	Employees
A	=	Actor	Management, workforce
T	=	Transformation	Individualism teamworkers
W	=	World View	Teamwork is essential due to tasks becoming more complex and co-ordination more important
O	=	Owners	Management
E	=	Environment	Premadonnas Individualism

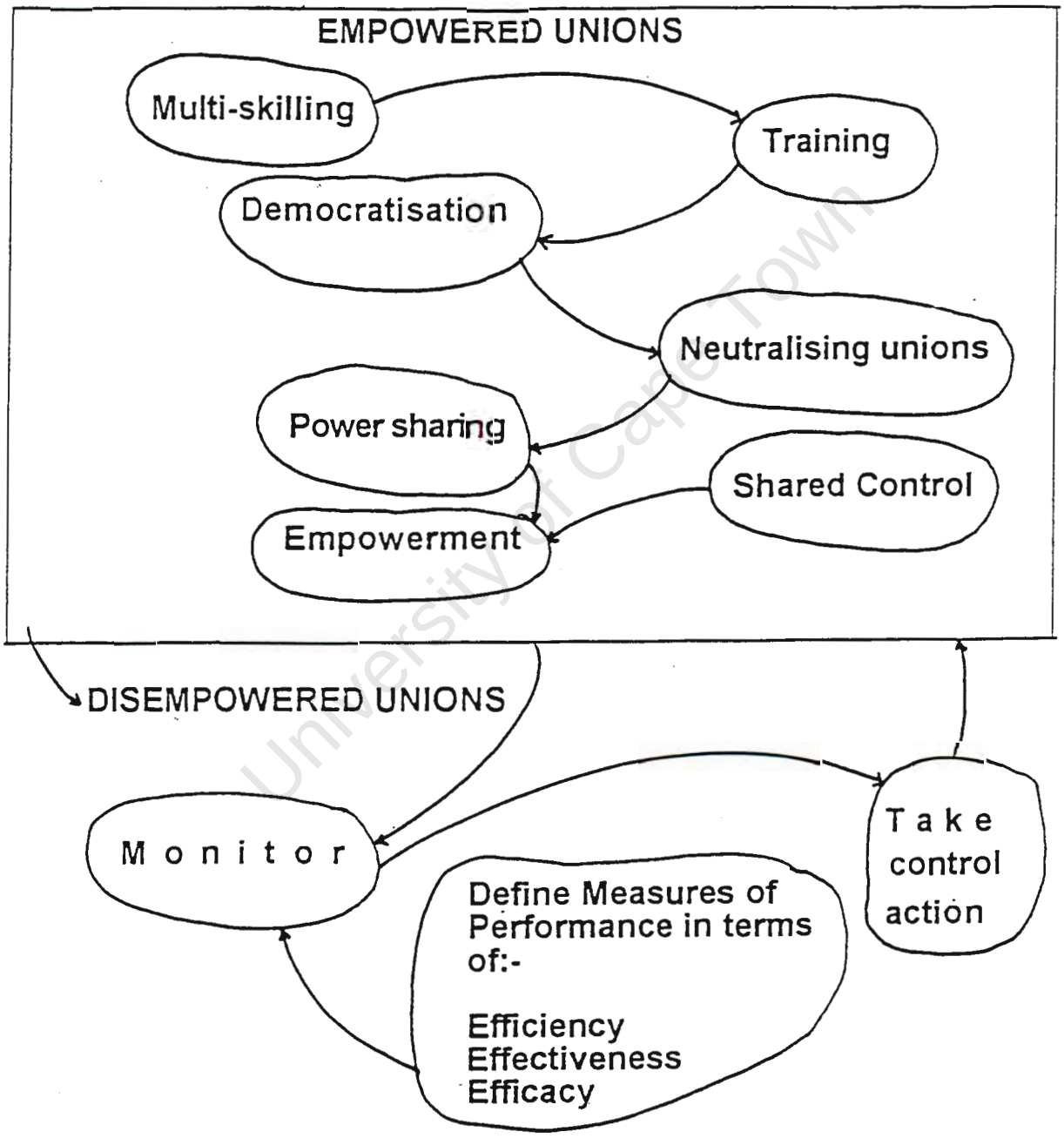
Root Definitions 9

Teamwork is a system for transforming employees from individual to team players to enhance the capability of the organisation in facing complex tasks given the self-centred constraints of certain individuals.

Root Definition 2

The internal markets model is a system owned by Howden, operated by the workers and management to undermine the authority of the unions through devious and poor management practices.

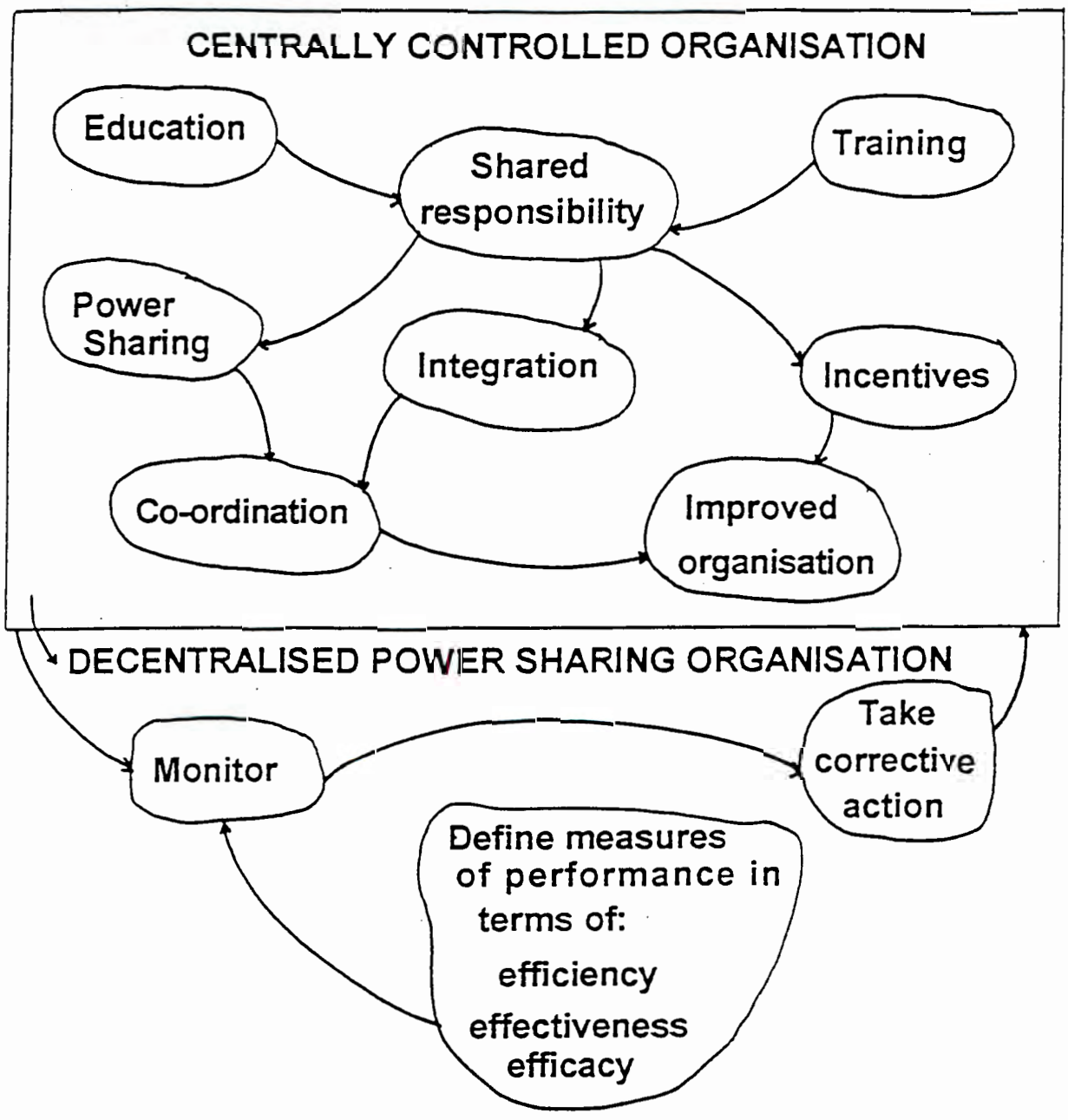
Fig. 12



Root definition 3

The internal markets model is a system owned by Howden Africa which enables and facilitates power sharing and empowerment by decentralising power for the good of all given the constraints of the market place.

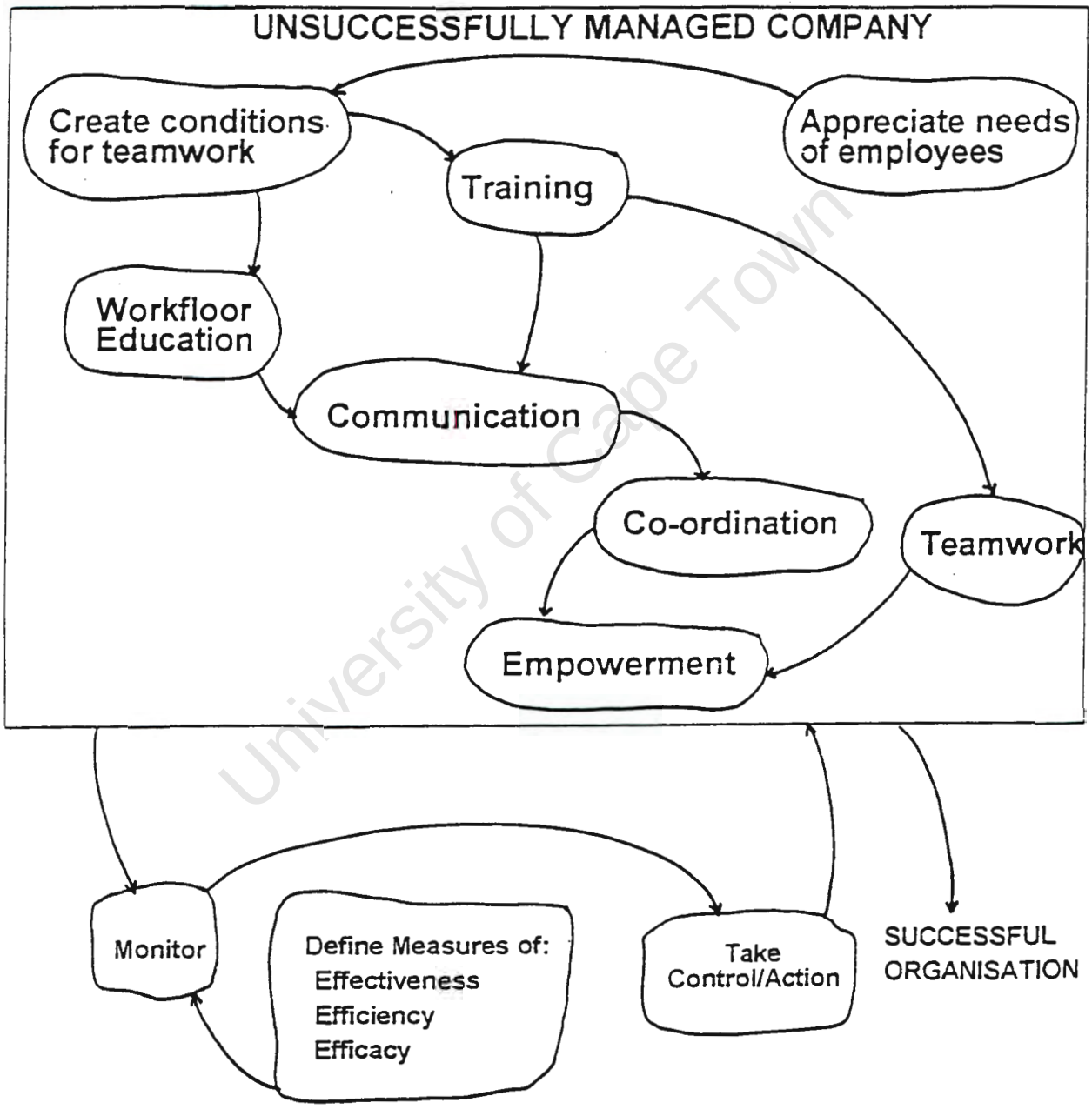
Fig. 13



Root Definition 4

The internal markets model is a system owned by management (HGSA) operated by the work force which could successfully transform the organisation if the constraint of education and training are overcome by management who must create the necessary condition prior to implementation

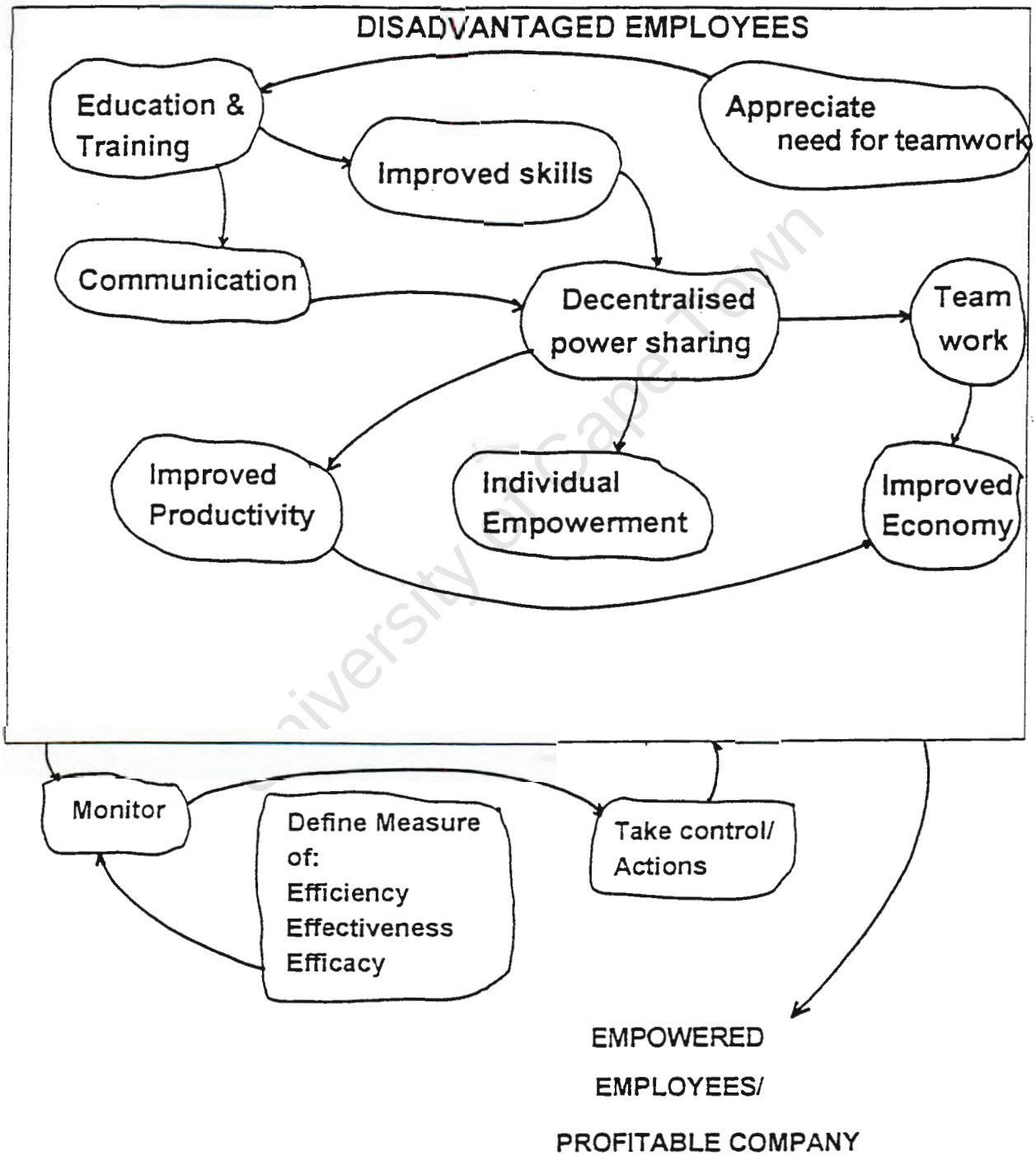
Fig. 14



Root Definition 5

The internal markets model is a system operated by the workers for empowering all employees by decentralising power so that the company can contribute towards the upliftment of the South African economy given the constraints of a once autocratic management style.

Fig. 15



Unions World View **Table 2**

No	Activity	Perceived Reality
1	Multi-Skilling	Multi-skilling is a prime requisite for improved productivity and long term profitability. At present the work force is only used to the advantage of the company and not for improving the individual.
2	Training	Training of employees is non-existent. Only those who wish to progress will go on courses but a focus training program is not actively in place.
3	Democratisation	Democratisation is practices on a very low level. When management wants to show that they are willing to share power, then only do they give employees a say. These issues which employees are allowed to participate in are normally minor issues.
4	Neutralising	The power base of the unions is under threat from management. By implementing the internal markets concept employees will now become shareholders in their various cells thereby removing the need for a union.
5	Empowerment	Workers are still used for the good of the company with no regard for individual development. Empowerment is not given freely but regulated by Government legislation.

Management's World View **Table 3**

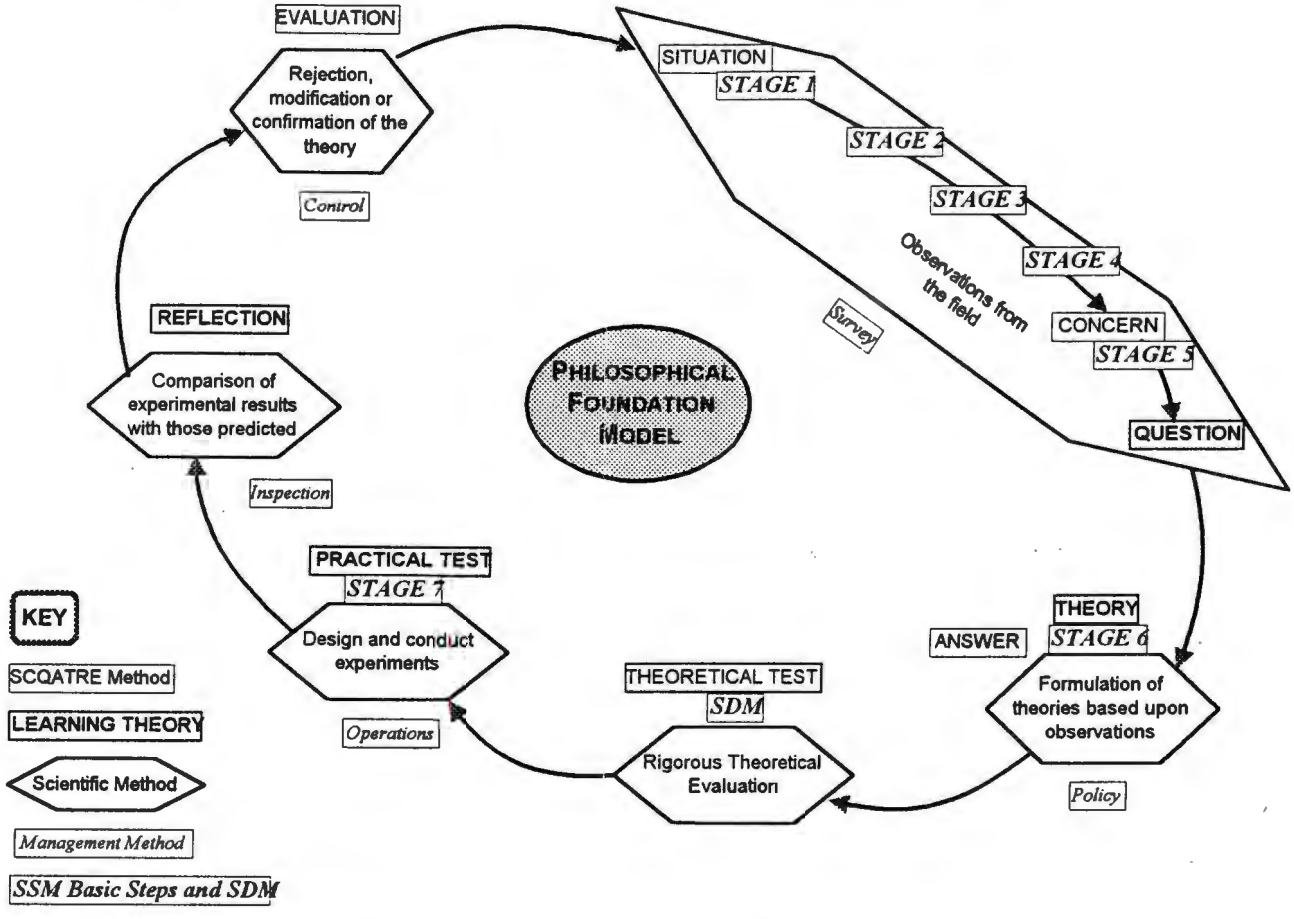
No	Activity	Perceived reality
1& 2	Education and Training	Education and training informally is very vibrant within the organisation. It is however a serious shortcoming that from supervisors down there is very little formal training, resulting in a total lack of responsibility.
3	Shared Responsibility	The responsibility is focused mainly on management. Workers are to ignorant and immature to be given responsibility. This has happened previously and resulted in abuse of power by managers who were promoted up from the shop floor.
4	Power-Sharing	This is in the process of becoming a reality. The unions and supervisors are being actively involved in the negotiating

		phases of the planned restructuring. This is generating a lot of confidence and goodwill on both sides of the table.
5	Integration	Integration is fast becoming a reality. The elimination of middle management has improved the communication both from the top down and vice versa
6	Incentives	An incentive scheme is presently in place, but is in need of being reviewed. It has serious short comings in that everyone is entitled to the same incentive irrespective of individual or department performance
7	Coordination	The flattening of the structure and the reevaluation of the objectives of the organisation is under the microscope. Work groups consisting of members at all levels of the organisation has been formed to recommend improvement which would foster improved coordination.

Worker World View Against the IFMM **Table 4**

No	Activity	Perceived Reality
1	Create conditions for teamwork	Although many attempts have been made, a major weakness exists where the work force is not responsible enough to accept the decision making process leading to autocratic decisions still being made.
2	Communication	Communication has been a key focus within the organisation. Management has gone a long way in improving their communication but again the immaturity of the shop floor has lead to one sided communication.
3	Teamwork	At a shop floor level this is now in an advance stage. Political objectives of individuals are still a major problem due to employees not fully understanding this concept.
4	Empowerment	We would be fooling ourselves to believe that workers are fully empowered. Until the conditions are created, empowerment will always be in piecemeal and selected by management.

THE MODEL INCLUDING SOFT SYSTEMS METHODOLOGY



Diagrammatic Representation of the Model

DESCRIPTION OF THE MODEL

The model is a synthesis of the work of Checkland, Peirce, Revans, and Handy. Our model relies strongly on the SCQARE method as presented by Tom Ryan.

The complexity of our model is evidence of our belief that simple learning wheels as described by Handy and Senge amongst others is inadequate in describing a viable scientific methodology.

The seven basic stages of Soft Systems Methodology are shown relative to the model.

ADOPTING JAPANESE SYSTEMS AND WORK METHODS IN A SOUTH AFRICAN COMPANY

by

JOACHIM FREDERICK MENTZ

Half thesis presented in partial fulfillment of the requirements for the degree of Master of Science in Industrial Administration at the University of Cape Town

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School of Engineering Management

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I would like to thank Professor Tom Ryan of the School for Engineering Management at the University of Cape Town, for introducing me to a refreshing way of inquiry and making sense of the hazy world of the modern organization.

I would also like to thank my wife Lodie, for proof reading this dissertation and for the support she and my two sons Joggie and Thinus gave me during the months of developing this dissertation.

Above all: God, for guiding me.

J.F. MENTZ

7 MAY 1997

PRETORIA

DECLARATION

I, the undersigned, hereby declare that the work contained in this thesis is my own original work and has not previously in its entirety or in part been submitted at any university for a degree.

SIGNED ..... DATE .....7 MAY 1997.....

ABSTRACT

Japanese systems and work methods have been viewed by Western companies, especially in the manufacturing sector, with envy and initially with an amount of skepticism. After their early successes in the automotive industry and later in the electronics industry, most Western organizations waited for the bubble to burst. However, this did not happen!

Western organizations started to look with more interest at these systems. Several publications saw the light of day, trying to describe and analyze these systems. The primary objective appeared to be the development of "easy to implement recipes", that would ensure instant success. Due to the apparent simplicity of the way in which these systems were described, most Western organizations rushed into adopting these systems in its entirety or selectively, looking for immediate short term benefits - **it all seem so logical!**

Unfortunately these systems "failed" in most of these organizations.

This dissertation attempts to find an explanation why the implementation of these systems does not appear to produce the same benefits as in the Japanese companies, by analyzing events at Nissan SA, an automobile manufacturer in South Africa.

The writer uses an analytical framework to conceptualize and articulate the process of inquiry. A pragmatic approach is adopted, using The Scientific Method as a method of fixing belief , to try to develop an understanding of why the organization does not achieve the same benefits from the adoption of the Japanese systems and work methods.
The organizational learning process and the organization's ability to implement changes, are explored to formulate an explanatory hypothesis that can be experimentally verified.

The writer comes to the conclusion that there must be a fundamental synergy, or at least some compatibility between the underlying management philosophies of the organization and the underlying philosophies of the Japanese systems that are adopted. These management philosophies need to manifest itself in the behaviour of the management, as opposed to being just the espoused systems, management wishes to superficially display as a public relations exercise.

Although the Japanese systems and work methods appear to be technically feasible, management needs to analyze their systems-in-use very sincerely and honestly to ensure that these changes will also be culturally acceptable within the organization.

Once the match has been made at the philosophical level, the systems and work methods can be implemented by rigorously following the self-correcting loops of the well known Japanese method of PLAN - DO - CHECK -ACTION.

The fundamental mindset should be that only miracles happen instantaneously; sustainable success takes a lot of hard work, dedication, patience and above all rigorously working the system and allowing the system to work for you.

CONTENTS

THE THEORY

CHAPTER 4

CHAPTER 5

CHAPTER 7

APPLICATION

CHAPTER 8

CHAPTER 9

CHAPTER 1.

This chapter introduces the reader to the SCQARE-framework that was used as a thinking framework for this dissertation. It provides the writer and the reader with a logical grouping of the various aspects that forms this dissertation.

INTRODUCTION

Many good ideas never realize their full potential and in some cases do not progress beyond the initial stages, because they are not articulated in a way that is understandable to the stakeholders. The stakeholders being the people that can influence or are influenced by the idea.

A useful framework for the conceptualization and articulation of ideas was developed by Professor Ryan from the University of Cape Town. (Lecture notes, 1995) He calls this the SCQARE framework.

The framework is used to arrange the ideas that need to be articulated in terms of six distinct elements or phases. This helps the writer and the reader to make more sense of the available facts because they are grouped in logical groupings.

The name of the framework is an acronym of the six different elements:-

S - Situation or System
C - Complication or Concern
Q - Question
A - Answer
R - Reasoning
E - Evaluation

SITUATION or SYSTEM

An idea never exists in a vacuum. It always operates in a containing whole or environment and interacts with other ideas and/or elements. The situation is the set of circumstances under which the idea has relevance. The more universal the set of circumstances, the wider the application of the idea.

When the situation is described in terms of two or more interacting elements, it can be viewed as a system. When an additional element is either added or taken away, the system changes as a whole and the particular elements also change. If this is not the case, the additional element is irrelevant to the system and does therefore not form part of it.

A situation can be viewed in many different ways by different stakeholders who have different needs, expectations and motives for it. The difficulty of absolute or universal limits should be carefully considered as knowledge needs to be independent of the content of the system i.e. a problem has to be examined on a higher plane of thought than where it had been created. The relevance of ideas regarding the system in focus makes an important contribution to the values of the ideas to others.

COMPLICATION or CONCERN

A complication is often brought about by a change in the situation or the environment it operates in. Useful words to describe complication are discomfort, doubt, pain, hurt, unhappiness, difficulty or mess.

A complication on its own may not directly affect the system, but in most cases it raises a concern if it is perceived to be not attended to. This causes dissatisfaction or doubt which in turn inspires inquiry to take place.

Concern can also relate to the way things are managed. There may be an amount of dissatisfaction that can probably increase if no counteraction is taken. In all cases their is a perceived need to bring about change. It is very important to realize whose perception

these are and that the perception of all the stakeholders must also be considered and understood before intervention.

QUESTION

Concerns are normally expressed in very general or abstract terms. When they are reframed as specific questions, they are far more concrete and therefore easier to deal with. Experience has shown that a maximum of 5 questions should be considered and tested with the stakeholders where possible. This is consistent with Miller's theory that the human's short term memory can only deal with a limited number of concepts at one time. (Hoebeke, 1994)

The questions are not intended to explain the concern or to describe it in detail, but are only asking some relevant questions about the concern. The process of inquiry that follows to answer the questions, should lead to an explanation or a better understanding of the concern. This should then lead to proposals for action that will address the concern to the satisfaction of most of the stakeholders.

ANSWER

The answer is the result, conclusion or proposed action drawn from the outcome of the total process. It would normally contain an explanation of what caused the concern in the first place.

There is seldom one right answer. It is therefore useful to generate various alternatives and then discuss it with the stakeholders. This can also help to promote the implementation of the answers, because it has been shared and shaped with the stakeholders.

The answer should explain the cause of the concern at three levels, i.e.

What affect did the cause have on the situation to give rise to the concern?

How did it affect the situation?

Why did it affect the situation in the way that it did?

The answer has a more than average chance of solving the problem if these questions can be explained to a reasonable level of satisfaction to most of the stakeholders.

REASONING

The quality and rigor of the reasoning that you follow, will to a large degree affect the confidence displayed by the stakeholders in the answer.

Ryan (Lecture notes, 1995) argues that a full understanding of the situation and concern will reveal the relevant information needed. How one proceeds from there to the answer is a product of your reasoning.

Any reasoning process contains three distinct elements i.e. the system or **case**, the answer or **rule** and the concern or **result**. The purpose is to develop an answer *(rule)* that will deal with a concern *(result)* in a particular system *(case)*.

EVALUATION

The ideal way of evaluating an answer is to take the actions it suggests and physically confirm whether they deal adequately with the concerns of the situation. However, this should only be done after it has been tested against the experience of as many of the stakeholders as possible. If an answer leads to a better understanding of some past experience it is likely to offer something of value in finding an explanation and/or solutions for the concern being investigated.

CONCLUSION

The SCQARE framework will be used as the containing structural framework for this dissertation to assist the writer and the reader to acquire a richer understanding of the process of inquiry.

CHAPTER 2.

This chapter gives a summary of the structure of this dissertation by graphically illustrating the basic approach and briefly giving an overview of the contents of each chapter.

THE STRUCTURE OF THIS DISSERTATION

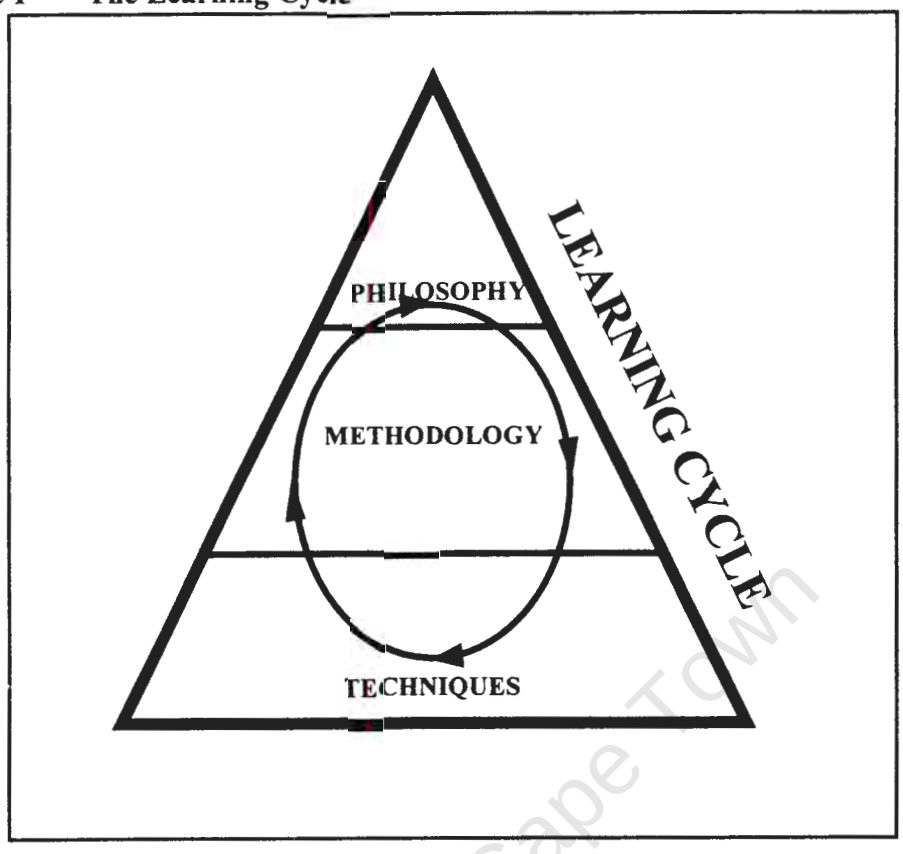
To enable the manager to take purposeful action to address a specific concern, he needs to understand the situation. It must have meaning to him for it to be relevant - in other words it must be of consequence to be relevant.

The primary objective of this dissertation is to develop a universal framework that can be used to describe and understand concerns that arise, which require some form of management intervention. The framework can then be utilized to develop and evaluate possible actions in a structured manner. In the specific application in this dissertation, it is developed to be used for improving the success rate of implementation of Japanese work methods and systems.

The basic approach to this dissertation is based on a model of a learning cycle, which will loop through three levels of understanding and application. The highest level being the underlying philosophy that supports the methodologies applied to develop a better understanding of a particular situation. The second level being the methodologies themselves and the lowest level being the techniques utilized to develop a richer picture of the situation and which is used to carry out some operational and practical activities.
The principle behind the loop being that a problem which emerges at a specific level, can only be resolved effectively when the inquiry takes place from a higher level. (Lecture Notes, 1995)

This cycle is graphically illustrated in Figure 1.

Figure 1 The Learning Cycle



The framework for this dissertation is shown schematically in Appendix A, which is attached as a fold-out to assist the reader to form a coherent understanding as he progressively reads through the script.

The SCQARE Framework, as described in the previous chapter, is used as the overall structure of the dissertation.

The situation, complication and the questions which are used to develop the theme for this dissertation are described in Chapter 3.

The answer to the question uses Pragmatism, as described by Charles Peirce, as its philosophical base. A brief discussion of the writer's understanding of Pragmatism starts in Chapter 4. A brief discussion of the principles of Multiple Perspectives is done to help the reader to from a better understanding of the importance of acknowledging the various stakeholders in the different processes.

The reasoning process is conducted by using the Scientific Method through the processes of abductive reasoning to formulate an answer. The validity of this answer is verified by deduction and induction. Chapter 5 discusses this primary methodology as developed by Charles Peirce and adapted for management practice by Reg Revans.

Other theories and methodologies which are used during the reasoning and evaluation processes are described in Chapter 6. These are the theories of learning as developed by Mumford, Kolb and Handy, Double- & Single-Loop Learning as described by Chris Argyris, the PDCA Cycle which assists the reader to form a rich understanding of the processes that are in play during the introduction of change in an organization.
This is followed by a description of the Soft Systems Methodology as developed by Peter Checkland, the Viable Systems Model as developed by Stafford Beer and Work Systems as described by Luc Hoebeke. These methodologies are used to formulate a rich picture of the aspects that need to be taken into account when developing a proposal for management intervention to address the answer to the questions posed in Chapter 3.
The Human Performance Technology is also briefly discussed to assist in the evaluation process of the explanatory hypothesis.

Various techniques that will be used during the formulation of the explanatory hypothesis are discussed in Chapter 7. These are Affinity Diagrams, Interrelations Digraphs, and Process Decision Program Charts.

Chapter 8 describes the actual formulation of the explanatory hypothesis for the complication as described in Chapter 3, through the process of abduction.

Chapter 9 describes the evaluation of the explanatory hypothesis through a process of scientific deduction and induction.

Chapter 10 reflects on the total process.

CHAPTER 3.

This chapter starts with a description of the situation by briefly describing the Motor Industry, starting with the global industry and briefly describing the concept of "Lean Manufacture". The writer then hones in on the South African Motor Industry.
The focus then moves to Nissan Motor Corporation, starting in Japan and then moving to the United Kingdom with a brief discussion of Nissan Motor in the United Kingdom and to what extent they adopted Japanese methodologies and systems.
A more detailed picture is then drawn of Automakers SA, the South African licensee of Nissan Motor Japan.
The chapter concludes with the practical application of the second and third elements of the SCQARE-framework - Complication and Question. The complication raises a concern that drives the research process. This results in some questions being asked. If these questions can be answered adequately, it would deal with the concern.

SITUATION

THE GLOBAL MOTOR INDUSTRY

HISTORICAL OVERVIEW

More than forty years ago Peter Drucker called the Automotive Industry the "industry of industries" (Drucker, 1946). Automobile manufacturing is still the largest manufacturing industry in the world, producing collectively more than sixty million vehicles per annum.

For centuries European craft producers led the Global Automobile Industry by producing various horse drawn vehicles. Around 1887 European engineering companies and coach builders started to build gasoline-engined automobiles. This marked the start of an era in the history of the Automobile Industry which was known as the era of the craft producers (Womack, et al, 1991). These craft producers were building automobiles for the wealthy customers based on the customers specific requirements. The vehicles were built by highly skilled craftsmen and time and cost were not important. They were using simple but flexible tools to make exactly what the customer wanted - one vehicle at a time.
The next significantly different era in the history of Auto-Manufacturing was mass production, started by Henry Ford in the early 20th century in the USA.
The first mass produced car was the Model T Ford, which was launched in 1908.

The fundamental principle was to build large volumes of cars at low cost to make them affordable to the working masses. The vehicles were produced on continuous moving assembly lines with the economies of scale lying in "standardization". This resulted in lower flexibility to meet the specific needs and requirements of different customers.
The mass producer uses narrowly skilled professionals to design products made by unskilled or semi-skilled workers. Very expensive single purpose machines are used in the production of the vehicles.
The key to mass production was the complete and consistent interchangeability of components and the simplicity of attaching them to each other.

The mass production of vehicles, through the efforts of Henry Ford and Alfred Sloan of General Motors, was largely responsible for the domination of the world economy by the United States.

After World War 2 the Japanese automobile manufacturers started to become more prominent and today the rest of the world, including US and European manufacturers see the Japanese auto manufacturers as the role model. The Japanese car manufacturers' renowned strength and success are not just the result of cheap capital, their state-of-the art factories or strong support from their government. Toyoda and Ohno at the Toyota Motor Company of Japan pioneered a new concept, which Womack et al called lean manufacturing (Womack, et al, 1991). Lean manufacturing combines the advantages of craft and mass production, while avoiding the high cost of craft production and the rigidity of mass production.

LEAN MANUFACTURING

The most striking difference between mass production and lean manufacturing lies in their ultimate objectives.

- Mass producers set a limited goal for themselves to achieve a level of being "good enough" - an acceptable number of defects, a maximum level for inventories and a narrow range of standardized products.

- Lean manufacturers set their sights on perfection, zero defects, continually declining costs, zero inventory and endless product variety.

Manufacturing is one of the most complex human group activities but the fundamental principle is that processes can be understood. Understanding provides the ability to predict behavior which results in the process becoming more manageable. However, manufacturing consists of more than processes. Effective manufacturing systems form a synergy between the products and the processes. Manufacturing comprises the technical and economic processes that convert raw materials, energy and purchased items into components for sale to other manufacturers or as end items.

The complexity of new products and the disappearance of the learning curve are phenomena that are being experienced increasingly by manufacturers. Responses to these phenomena result in manufacturers having to do things faster and require involvement of all departments of a company in the design process from the beginning. To overcome time compression, manufacturers must be able to use experience from previous design activities to aid the current one - systemized learning

Concurrent design seeks to integrate the concerns of marketing, production, field service and performance orientated design. This will result into effective and efficient manufacturing, in other words it is designed for manufacturing while it does not loose its serviceability or its fitness for use in terms of fulfilling the customers' needs.

The underlying principles for lean production can be summarized as follows:-

- Lean production is a system of reciprocal obligation between all roll players. Share the bad times as well as the good times. Worker participation and free flow of information are critical for success. This is one principle that is not readily accepted in Western society. Western people still view knowledge as individual property and sometimes the nucleus of a personal power base.

- The maximum number of tasks and responsibilities are transferred to those workers actually adding value to the car on the line. Workers are empowered to stop the

assembly lines when problems occur. Once again the tendency in our work environment is to delegate the responsibility, but to withhold the authority required to sometimes do what may not be the most popular action - even if it is the best solution in a particular situation. Employees are flexible in work assignments and active in initiating improvements. As a counterweight, management assures lifetime employment and pay graded by seniority as well as linking it to company profitability through bonus payments.

- There is a system in place to detect defects early and to trace them back to their ultimate cause quickly. Quality is therefore free since it is built into the product and not reworked at the end of the line.

- Small production batch runs for parts ensures low inventory and enables the producer to identify problems quickly and assists that corrective action can be taken immediately.

- A long term commitment between the component supplier and the lean producer is the norm. Component suppliers are organized into functional tiers and they are involved in the product development process. Supplier selection is done at the outset of the project and costing is based on market price of the vehicle minus system. Continuous decline in component cost over the model life is a given.

- Ease of manufacturing is not an accident but is a result of a lean design process.

- The principle that is adopted is that a lean organization must be in place before high-tech process automation is adopted if the company wants to gain the full benefit.

- The dealer is seen as the first step in the Kanban system. There is a shared destiny between the factory and the distributors.

In summary it can be seen that a closer relationship between all the roll players replaces a vicious circle of mistrust with a virtuous circle of co-operation. This is demonstrated by the fact that direct delivery to assembly lines without inspection can take place.

The total process can be seen as a system with all the elements in synergy and with a clear understanding of the requirements and everybody working towards a common objective to the benefit of all the stakeholders.

THE SOUTH AFRICAN MOTOR INDUSTRY

The automobile manufacturing industry in South Africa started with Ford and General Motors in Port Elizabeth. Many of the current top management in the industry have started their careers with one of these companies. They have therefore been schooled in the "Fordist" school of mass production.
The German based manufacturer Volkswagen followed and it was followed by the Japanese sourced vehicles from Toyota and Nissan and other companies from Japan, the USA and Europe.

Automobile manufacturers are operating in a very competitive segment of industry. There is a high level of competition among the 7 major local motor manufacturers in South Africa. With South Africa adopting the General Agreement on Trade and Tariffs (GATT) principles and with the implementation of the Motor Industry Development Program (MIDP) in 1995, fully imported vehicles are becoming more price competitive than in the past.

In the past vehicles have been produced mainly for the domestic market. Due to changes in the legislation, it is expected that the export of vehicles will become more significant in the future.

The Automobile Market is a very dynamic market, especially in South Africa where the market has traditionally been "spoiled" in terms of the variety of available models and specifications. This results in a requirement to produce a large number of variants, although the volumes are relatively low. Frequent changes to products and replacement of models on average every 4 years are also the norm.

The initial success of a new model after introduction is greatly dependent upon the "readiness" of the production facility to produce volume at the right quality and cost from the outset. This puts a great emphasis on the effective planning and management of the changes.

The South African market is ideally suited for the lean manufacturer. The market demands great flexibility in terms of variety of products and specification levels. The volumes are relatively low and are also fluctuating substantially due to changing demand.

NISSAN

NISSAN MOTOR LIMITED, JAPAN (NML)

Nissan Motor Limited (NML) of Japan is the fourth largest manufacturer of automobiles in the world and the second largest in Japan.

Their products are distributed world wide and they have manufacturing operations in Japan, the United States of America, Mexico, Spain, the United Kingdom and New Zealand. They have joint ventures in Thailand, Taiwan, Korea, Taiwan, the Philippines and Malaysia. There are also a number of countries where Nissan vehicles are produced under license i.e. Greece, Zimbabwe, Kenya and South Africa.

In 1914 the Kwaishinsha Company started to build Dat cars.
In 1931 the Dat Jidosha Company was formed and named Datsun and in 1934 the name was changed to Nissan.
Nissan started to manufacture Austin cars in Japan in 1952 and in 1963 its total production reached the one million mark (Nissan Corporate Information).

NISSAN MOTOR UNITED KINGDOM (NMUK)

The Nissan product was originally distributed in Europe and the United Kingdom by a private company.
In the early 1980's NML decided to expand their activities in Europe and the UK.
During this period the industrial relations record of the UK was perceived very negatively by the rest of the world. This posed a serious concern for any would be "outside" investor to the UK. In the view of these investors, the British worker was not particularly concerned with quality - a view which was reinforced by the attitude of managers who reinforced this apparent lack of interest by introducing large numbers of inspectors.
A second major concern was the British worker's and particularly the union movement's attitude towards flexibility in manufacturing.

However the need to expand their presence in the EEC was great enough for NML to make the investment decision. They decided to establish their manufacturing operation in the Northeast of England at Sunderland.

NML decided to focus their recruitment program on the local community, which had traditionally strong links with the trade union and labor movements.
They embarked on a very specific recruitment program focusing on stringently on specific selection criteria. These were mainly focused on a bias towards teamwork and the ability to adapt and to be flexible.

Nissan decided to adopt the proven Japanese management philosophy and work methods in NMUK. This philosophy was based on worker participation and working towards specific goals. These goals are all aligned to achieve the common company objectives. This work method also requires the workforce to be inwardly responsible for the quality of their own contributions. It also required a great degree of flexibility and multi-skilling.

NMUK is viewed as a role model for overseas assembly operations by NML and many of these operations draw from the learning experience at NMUK.

The success of NMUK can be contributed mainly to the adoption of Japanese work methods and management philosophy. It can be ascribed to implementing a system of improvement through a tripod of flexibility, quality consciousness and teamwork commonly known as "The Nissan Way" (Wickens, 1988).

THE NISSAN WAY

The Nissan Way can be described as a process during which management develop the workers to assemble various components producing vehicles. The workers are willingly participating because they are continuously being involved by management. The vehicles produced will meet the quality objectives of the company. It is achieved by applying the available technology and the fact that the workers accept the responsibility for the quality of their own work, through teamwork and timeous feedback from QC auditors. These auditors audit the vehicle quality and measure the defects identified against known customer perceptions. In this way corrective action is developed to ensure that the company and the people that buys the product, will benefit by receiving a vehicle with no apparent serious defects (Mentz et al, 1995).

An alternative description would be that The Nissan Way is a process during which all the processes are optimized by a team consisting of management and the workers. The optimization is done in terms of waste of capital, human resources and/or materials, through a systematic process of identification and elimination. It also involves the humanization of dehumanized routine tasks, that need to be performed by the workers. This is achieved by expanding the scope of the tasks into whole jobs and then developing the workers to acquire the specific skills required to do the additional tasks. This will then result in improved efficiency and effectiveness (Mentz et al, 1995).

The dilemma that arises is that Nissan's efforts and work methods are viewed in a very positive or in a very negative way, depending on the specific "Weltanschauungen" of the viewer.

NMUK as articulated by Wickens (Wickens, 1988) views The Nissan Way in a positive light, with benefits to both the company and the employees.

The view as expressed by Carrahan and Steward (Carrahan and Steward, 1992) sees the processes and activities of The Nissan Way extremely negative. They debate that NMUK achieved success by the control, exploitation and surveillance of the workers. This represent a form of powerlessness for many workers.

From their perspective The Nissan Way can be described as a process during which management exploit the workers by deliberately manipulating them into performing certain activities. During this process jobs are deskilled by management to fend off a potential threat, that workers will hold the company at ransom by withholding specific required specialist knowledge to support their own objectives. Management therefore purposefully ensure that the union and its officials' activities are restricted to a level where their status is reduced to being ceremonial and in no way a threat to the company. During this process the union and its members are too scared to counter with any industrial action. This also prevents countercultures from developing amongst the workers by not allowing any collective association that is not sanctioned by the company. It ensures that the company objectives and the company notions, which the workers would normally not support, will prevail (Mentz et al, 1995).

In comparing the above descriptions or root definitions and their activities with reality, the dilemma that emerges is that "reality" is merely an interpretation that is dependent on the particular world view that is applied by the analyst.

However, all the activities are relevant and relate to the real situation, independent of the particular world view, which is held. The problem however arises when these activities and processes need to be interpreted.

AUTOMAKERS SA

Historical Overview

In 1963 a vehicle assembly plant was established in Rosslyn, just outside Pretoria in South Africa. It was known as Rosslyn Motor Assemblies and assembled Datsun, Alfa Romeo, BMW, Peugeot and Renault products under license.
In 1973 the company became known as Datsun-Nissan and started to produce only Nissan products, but marketed as Datsun in South Africa.
In 1976 and 1978 Datsun cars were the top selling range in South Africa.
In 1983 the name was changed to Nissan SA and the products were marketed as Nissan, in line with Nissan worldwide.
In 1988 Nissan SA started to produce the very successful Fiat Uno under license to Fiat and a new umbrella company - Automakers SA was formed.

Current Situation

Automakers SA manufactures and distributes automobiles in South Africa under license from overseas source companies. These source companies are Nissan Motor Limited in Japan and Fiat in Italy. Automakers also supplies complete vehicles (CBU's) and components to other countries, mainly in Africa.

In very recent developments, NML has confirmed that they will be investing capital in Automakers, by acquiring the controlling interest in the company from 1 July 1997.

For the purpose of this dissertation we will therefore focus on the Nissan leg of Automakers' business.

The Product

The products are designed in Japan and the design therefore contains the elements conducive to lean production. NSA would in some instances make some design changes to suit the unique South African conditions.

The Material

Nissan SA has adopted the principle of categorizing and selecting preferred suppliers for specific components. These suppliers are normally involved from the initial stages of a project to ensure the shortest possible lead time to production. Suppliers are also encouraged to establish links with the Japanese suppliers to ease the transfer of technical information and know-how. In many cases Nissan SA and NML will act as the catalyst to get this relationship off the ground.

A principle of setting target costs for components based on the total vehicle cost is followed, but in most cases Nissan SA will still go out on market based competitive bidding. This can result in the supplier selection being reviewed and sometimes revised. In most cases this action adversely affects the long term relations with the supplier and violates the lean production principle of long-term commitment between the supplier and the producer.

The process of continuous cost reduction on components after they are in production is enhanced by Nissan SA through activities like MCI (Minimum Cost Investigation) and TCI (Total Cost Investigation) where joint investigations are done with the suppliers to improve their processes and systems to the benefit of both parties.

Nissan SA does have synchronous supply on components supplied by suppliers who are in close proximity of the production facility. These suppliers deliver directly to the production line without any goods receiving inspection being done on their components. The average inventory holding in Nissan SA was reduced from around 22 days to 17 days for CKD components (imported components) and 2 to 3 days for local materials. Although this is a big improvement to what it used to be, it is still way above the typical

JIT volumes of the Japanese manufacturers, where inventory holding is down to 6 hours with synchronous supply on major components such as Seat Assemblies.

Nissan SA has recently changed the shipping method from the old "break bulk" format to containerization. This allows Nissan to ship components on a weekly basis with an expected resultant drop in average inventory holding.

Production

Nissan SA has also adopted and is actively promoting the ***Kaizen*** philosophy as used by NML. This is a system of continuous small improvements initiated by the worker himself, to improve his effectiveness in the job he is doing.

The ***Genba Kanri*** shop floor management principles were also adopted and with the assistance of Japanese experts sent by NML, the system is refined and focused on Nissan SA's specific needs and requirements.

Specific quality, cost and delivery (QCD) goals are set with the long-term objective of continuous improvement and ultimately zero defect.

With the introduction of the Nissan Plant Management System the focus is placed on the workers actually adding value to the vehicle on the line.

The Quick Response Quality Control (QRQC) system results in defects being detected early and traces it back to its source. Corrective action can then be taken immediately to minimize the possibility of producing more defects.

Summary

In an effort to remain competitive, Automakers and specifically its manufacturing arm in Rosslyn, Nissan SA Manufacturing Company (NSA) has to improve on a continuous basis. The company therefore rely heavily on the source companies for assistance in developing its capability.

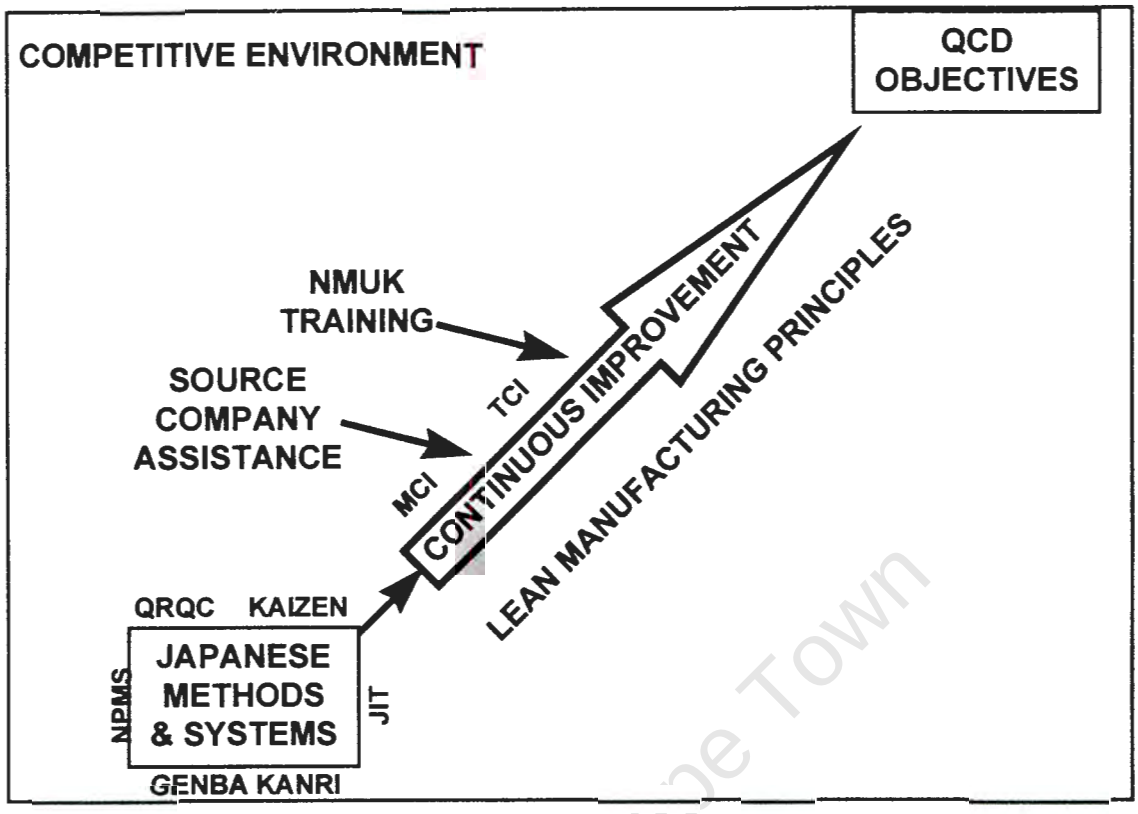
Major emphasis is placed on adopting the principles and work methodology from Nissan in Japan to improve Nissan SA's capability to achieve its Quality, Cost and Delivery objectives (QCD). These principles are based on lean manufacturing and concurrent activities to consistently achieve and exceed the QCD objectives.

Nissan SA, with the assistance of NML in Japan has adopted many Japanese work methods and systems based on the systems and practices applied in NML. NSA employees visit NML at regular intervals and NML has approximately thirty liaison people in South Africa, assigned on a full-time basis to support NSA. A training program has also been established with NMUK whereby NSA employees are trained at NMUK in The Nissan Way.

The fact that NML will take effective control of the company in July 1997, should enhance the whole process of adopting Japanese work methods and systems further.

The illustration in Figure 2 summarizes the process of continuous improvement in Nissan SA.

Figure 2 **Process of Continuous Improvement in NSA**



COMPLICATION

We think we know and understand the Japanese work methods and systems, yet we do not seem to be able to make it work to the same degree and with the same level of success than NML or NMUK does.

This complication raises a concern that the effectiveness of the principles and the methodology of the Japanese systems in the South African industry conditions are questioned. The feeling amongst some of the people in NSA is that although the Japanese methods appear to work well in Japan, they can not be applied in the South African manufacturing environment. Unfortunately this opinion is not only held by the operating level, but some senior managers and executives share this view, although many of them would never admit it.

QUESTIONS

Many questions have been formulated to enable the writer to select the most appropriate question/s that would steer the research process in the most effective direction to address the concern.

After a screening process that tested the question against the following fundamental principle:-

Would we be able to deal with the concern adequately if this question is answered?

The following two questions were selected to drive the process of inquiry:-

Can the Japanese work methods and systems be introduced more effectively in the South African industry conditions?

What needs to be done to implement Japanese methodologies and work systems more successfully in Nissan South Africa?

The first question is directed towards **confirmation** that the Japanese systems can be adopted in NSA successfully and the second question is directed to establish **how** NSA should go about during the implementation phase of adopting these systems.

CHAPTER 4.

To enable the manager to take purposeful action to address a specific concern, he needs to understand the situation. It must have meaning to him for it to be relevant - in other words it must be of consequence to be relevant. The manger needs a philosophical framework to guide him through the process of inquiry that would lead him to a viable solution. This leads us to the philosophy of pragmatism which was described and developed mainly by Charles Peirce and William James.

In this chapter the writer briefly describes his understanding of the philosophy of Pragmatism. He then discusses the main methods of fixing belief which then lead into Chapter 5.

PHILOSOPHY OF PRAGMATISM

The word pragmatism is derived from the Greek word "pragmata" which means acts or affairs or business.

It is generally accepted that Charles Sanders Peirce, an American philosopher of the late 19th and early 20th century, was the first person to use the word pragmatism to describe this philosophy. Peirce, however did not agree entirely with James's interpretation of pragmatism. He was not too sure whether he or William James was the first to use the term pragmatism. He therefore used the word "pragmaticist" in some of his writings. (Reilly, 1970)

The underlying philosophy of Pragmatism is the process of understanding the meaning of the processes which are in play and which influence the situation. This understanding is then applied to make things work. **If you cannot make it work it is not relevant.**

Pragmatism stands for the way of making our ideas clear. A more accurate description may be a method of logic or a method of determining the meanings of intellectual concepts upon which reasoning may hinge.

Peirce's original formulation was (Britannica, p 414, 1964):-
"Consider what effects, that conceivably might have practical bearings, we conceive the object of our conception to have. Then our conception of these effects is the whole of our conception of the object."

An equivalent formulation of William James (Britannica, p 414, 1964) is that *"the whole meaning of a conception expresses itself in practical consequences, either in the shape of conduct to be recommended or in that of experience to be expected if the conception is true, which consequences would be different if it were untrue, and must be different from the consequences by which the meaning of other conceptions is in turn expressed."*

Compare this with the central teaching of British empiricism, which has taught that none of our conceptions or the verbal expressions of them has a meaning, unless it has been derived from some elementary sensory impression. Stated differently, it affirms that all knowledge is based on experience and denies the possibility of spontaneous ideas or a priori thought.

Pragmatism teaches that no conception has meaning unless it can be applied directly or indirectly in the location and description of something that might be revealed to our senses.
The positive content of Pragmatism is therefore that all our conceptions, even the most abstract, derive their peculiar point or meaning from things or from differences in such things as we can actually observe and point to. Pragmatism has certain features which constitute a further important development of traditional empiricism.

Two things may differ practically for us in so far as we find it necessary to treat them differently or we would expect different reactions from them. Similarly, according to pragmatism, two conceptions have different meanings not because of some direct relation between word and thing, but because of their different uses or applications.

Pragmatism therefore rests upon what can be called a procedural theory of meaning. This principle has proved a most searching tool of criticism. If one conception does not differ practically (in Peirce's sense) from a second, then our employment of it adds nothing to

our employment of that second conception. We are sometimes tempted to get engaged into speculations which have no assignable practical bearings. According to pragmatism our thoughts and words then have no assignable meaning whatsoever. This principle can be very useful in management practice, especially during debates and meetings. It can be applied as a screening mechanism to confirm the real relevance of the subject of the debate in the specific situation. In so many situations lengthy debates are conducted around totally irrelevant issues!

Peirce identified that pragmatism teaches that our descriptions of things are to be understood as our ways of dealing with those things. In some cases dealing with them from a highly specialized standpoint in some respects, but in other respects entirely general. We may then attempt to find out how observation, hypothesis, deduction and the checking of consequences show these things to behave. This ties in very closely with the principle of multiple perspectives.

MULTIPLE PERSPECTIVES

The principle of multiple perspectives is that different people observe and interpret situations differently depending on their specific "Weltanschauung" or view of the world, which in turn is developed through their own specific life experiences (Rosenhead, 1989). This principle is very useful during the planning of the implementation of changes or when ideas are being formulated to present to a group that consists of people of different backgrounds and social standing. (As is the case in most real life situations, especially currently in South African business).

The perspectives can in most cases be divided into 2 main groups:-

1. Technical

   The Technical perspective can be sub-divided into elements relating to processes and organizational elements.

   To analyze the processes, the question that needs to be answered is: "When does this take place?"

To analyze the organizational aspects, an investigation into what takes place must be done.

2. Human.

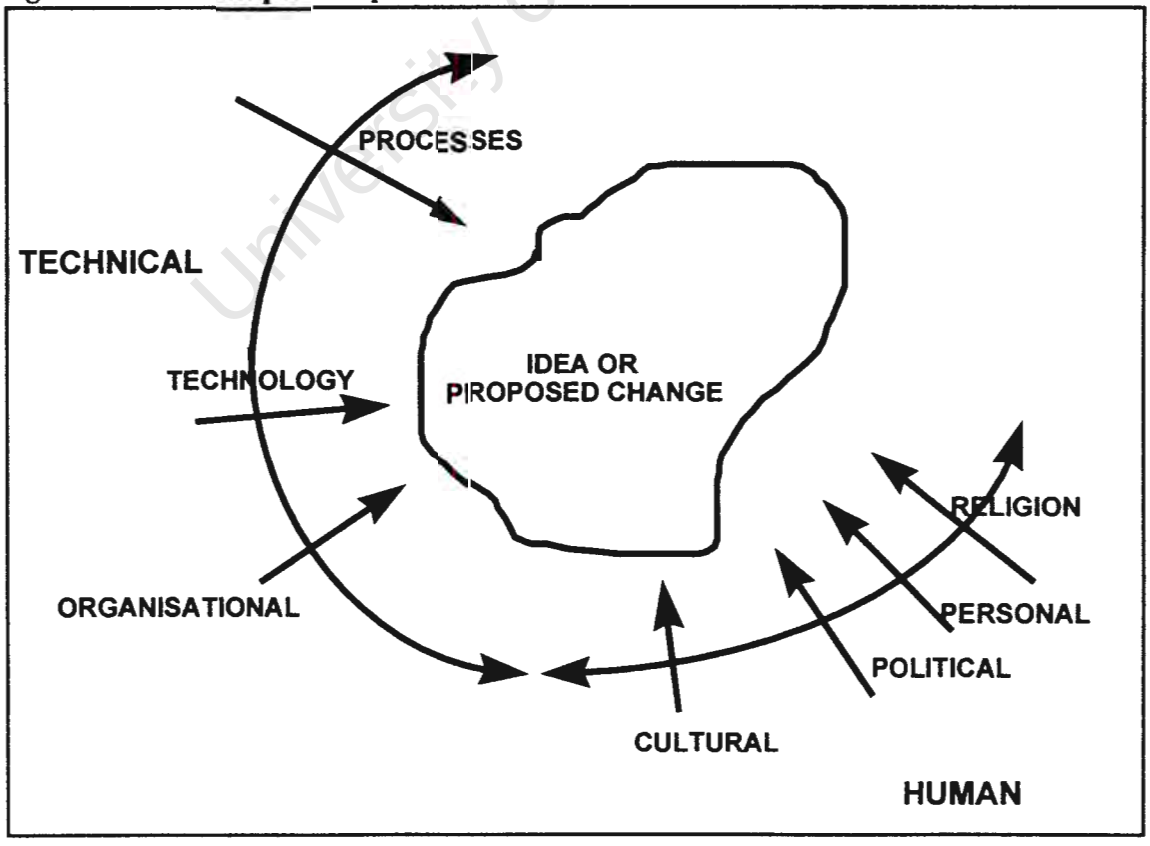
The Human perspective can be sub-divided into cultural elements and elements that stem from political roots.

The cultural aspects will be addressed if there has to be a description of how the changes will be implemented or how the idea will affect the environment in which it is relevant.

The politics are determined by the question of who benefits from the introduction of the change or the adoption of the idea and who is affected by it.

Figure 3 illustrates multiple perspectives in a graphical format.

Figure 3 Multiple Perspectives



BELIEFS AND MENTAL MODELS

Within the framework of pragmatism we can apply the theory of belief or a mental model that exists within individuals or even within groups. Peirce states in his *"Fixation of Belief"* that *"the action of thought is excited by the irritation of doubt and ceases when belief is attained."* (Reilly, 1970, p. 15)

We know the world in terms of beliefs or the mental model we have about it. For these beliefs to be relevant and to influence our rules for behavior and expectations, they have to be stable.

If there is a gap between our expectations and the actual results there is a surprise.
This results into doubt in our beliefs and it becomes unstable.
Doubt paralyses and we cannot act because our stable base has been removed.

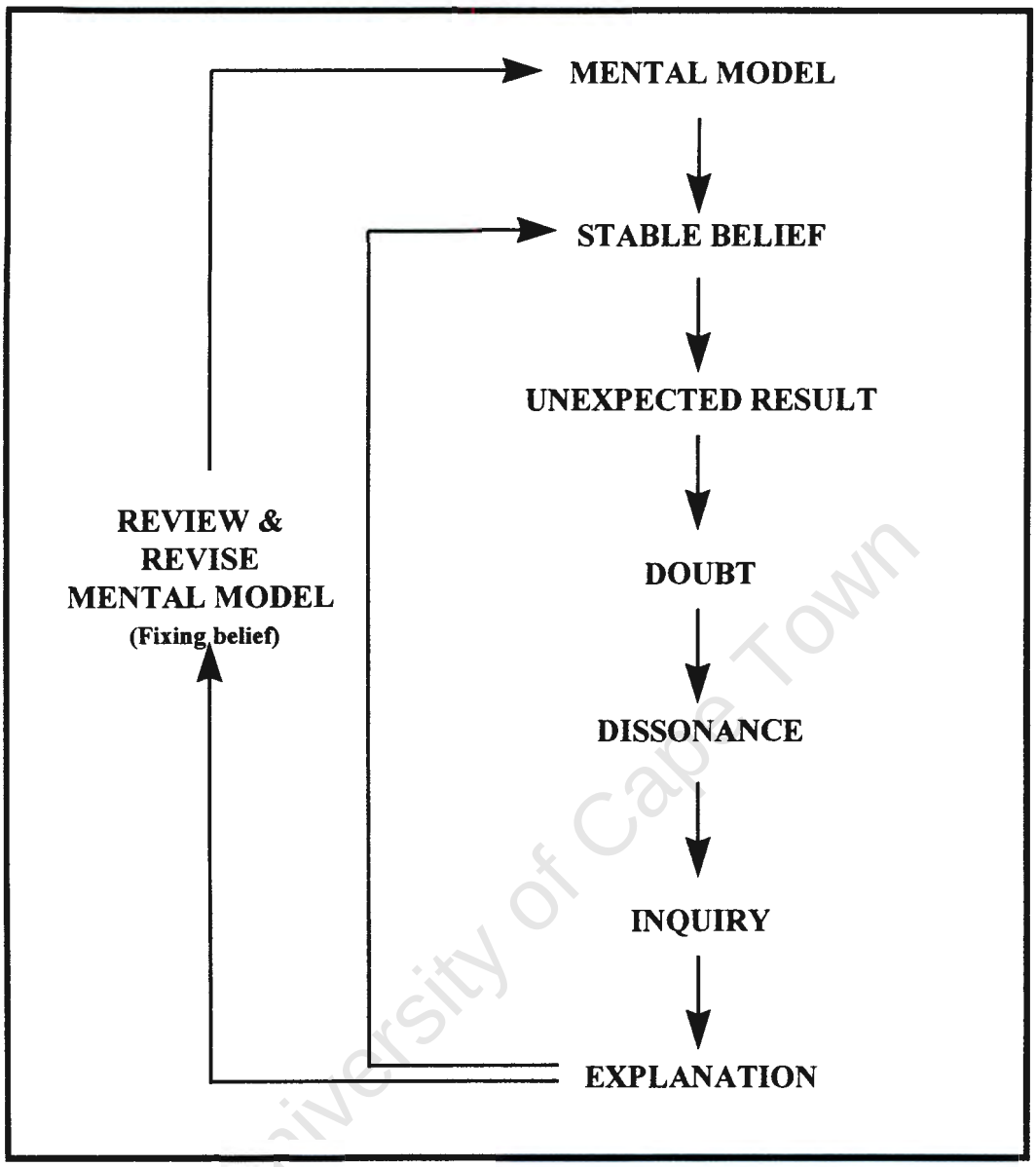
Peirce describes doubt as an uneasy and dissatisfied state from which we struggle to free ourselves, in order to re-establish the state of stable belief.

Doubt raises dissonance which starts a process of inquiry.
The purpose of the inquiry is to stabilize the belief again.

Peirce suggests that we use logic as a base and then make inferences from available data in order to establish or fix a belief.

This process is graphically illustrated in Figure 4.

Figure 4 The Process of Inquiry to Stabilize Belief



FIXING BELIEF

Peirce recognizes the following 4 ways of fixing beliefs (Reilly, 1970):-

- Method of Tenacity
- Method of Authority
- A priori philosophy
- Scientific Method

METHOD OF TENACITY

This method starts with a viewpoint or stance that is formed capriciously. This can be something that was learned in your childhood or an idea that was derived from something you have read or experienced or even heard from somebody else. At this stage it has no specific merit for the person that expresses it - it is therefore not a belief yet.
However, as it is increasingly being used, it gradually becomes a habit of thought and over time it eventually becomes entrenched as a permanent part of the person's mental model and is therefore fixed as a belief. In other words it is an opinion that is systematically and steadily evolved over time. This process does not happen in a scientific or strictly rational way, but rather in a biological way through it being used repeatedly.

The method of tenacity uses the process of conditioning in the most advanced and sophisticated kind of thinking.

METHOD OF AUTHORITY

This method of fixing belief manifests itself by appealing to authority - it is the will of the institution. Although this method has no scientific base, it is probably the most important method of fixing belief. It does not matter how highly an individual is placed in an organization, he is part of a social system which gives life to the institution of which he is a member. There would be a natural tendency to conform to the accepted ideas and values through pier pressure and group instinct. In most work situations or in business cartels or groupings, this method of fixing belief is very common.

The method of authority hinges on the fact that the believer finds himself inside a system of which he is an indivisible part and therefore his behavior is inescapably affected by the overall behavior of the system itself.

METHOD OF APRIORITY

This method of fixing belief starts from the base that people are born with some knowledge. This knowledge exists prior to experience - hence the name *a priori*.
Beliefs are fixed with what seems plausible. In other words it fits in with what we know and contradicting it would make our whole way of thinking about the world absurd. The main difficulty here is that all individuals do not adopt the same assumptions and what seems plausible to one individual may seem totally unacceptable to another. This is concordant to the principle of multiple perspectives.

Thus, the method of apriority uses the fact that all communication requires a language and assumes its seemingly scientific conclusions in the premises which underlie the axioms of that language.

METHOD OF SCIENCE

Peirce asked the question whether management theorists could learn from pure science (Lecture Notes, 1996).
He tried to apply the rigor of science to management practices and developed the method of science as a more scientific and precise method of fixing belief. An important feature of the method of science lies in its rigor. Rigor is a precise formulation of method - something which is clear and definite and which is testable and repeatable.

This method requires the inquirer to look for explanations of what he has experienced - the observation stage. He would then formulate a hypothesis for this explanation and finally he has to test the validity of the hypothesis theoretically and practically.
After comparison of the actual and the predicted outcome he would either confirm, modify or reject the hypothesis.

The stages of the scientific method as described by Peirce is:-

- Experience which starts the inquiry.

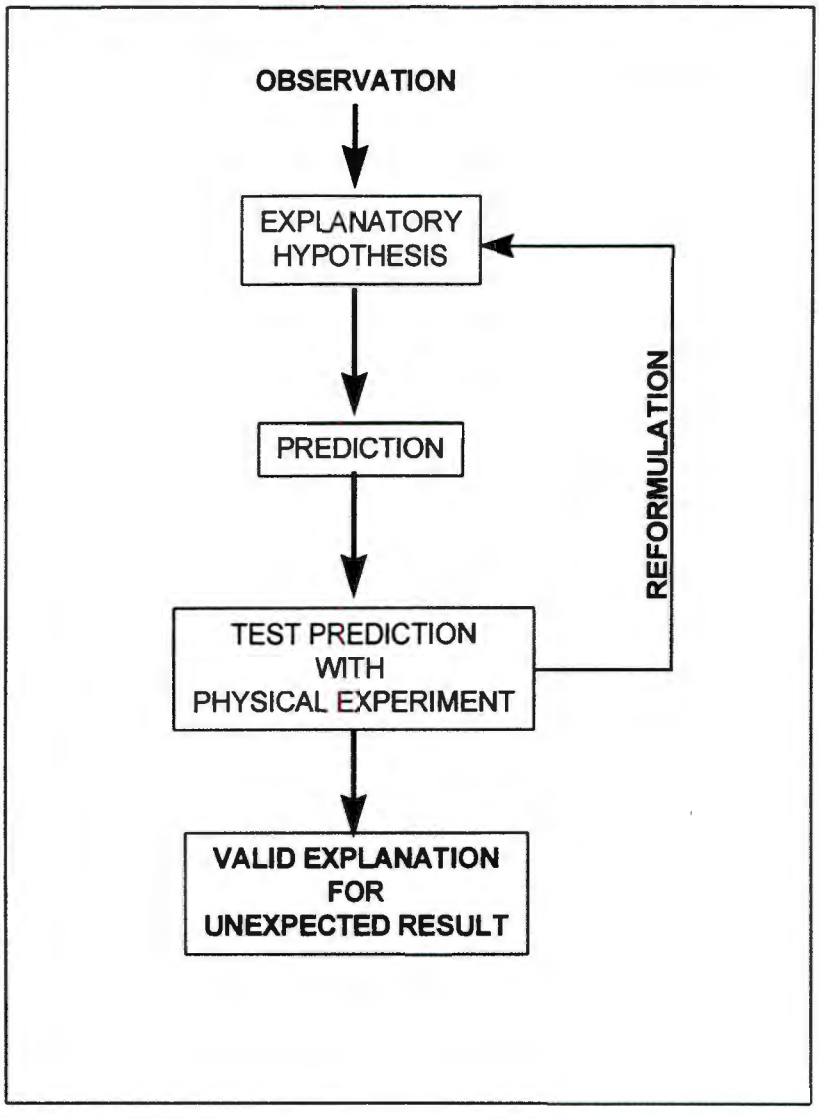
- Abductive phase to formulate the explanatory hypothesis.

- Verification phase consisting of the deductive and inductive phases.
  - Deductive phase to unfold experiential consequents from the explanatory hypothesis and to draw predictions of observable outcomes from the hypothesis.
  - Inductive phase is to see whether the predictions actually do come true.

The flow of the Scientific Method is graphically illustrated in Figure 5.

Peirce acknowledges that the method of science does produce a fallible result (Reilly, 1970). He states that knowledge gained through scientific inquiry cannot be absolutely exact, absolutely universal or absolutely certain. However, if the method of science is pursued rigorously and the stages are recycled continuously, it will converge onto the real truth. This indicates the self-correcting characteristic of the method of science.

Figure 5 Flow of the Scientific Method



The writer selected the Scientific Method of fixing belief, because it provides an objective and structured approach to make sense out of a problem which is probably caused by a maze of "softer" issues, which are normally very difficult to qualify in an exact manner. It allows the concern to be examined in a non-restrictive way without being bound by the net of preconceived beliefs based on limited inwardly focused experience of the past.

Since the scientific method will be used extensively in this dissertation, it will be discussed in more detail in the next chapter.

CHAPTER 5

This chapter forms the core of the reasoning process of this dissertation, which is based on the Scientific Method as initially described by Charles Sanders Peirce in the late 19th century and further developed by people like Reg Revans. There is a practically orientated description of the three reasoning processes which are followed in finding an explanation for the concern under investigation - Abductive, Deductive and Inductive reasoning.

The value of the Scientific Method in management practice is discussed by discussing Systems Alpha, Beta and Gamma and their practical benefit in terms of forming the base for developing a management model.

THE SCIENTIFIC METHOD

Charles Peirce did not agree with the lexicographer's description of science as systemized knowledge (Reilly, 1970). He describes science as the pursuit carried on by scientists.

He states that the true scientist is so interested to find the truth, that he would be willing to reject his present beliefs, if experience demands it.

Peirce maintained that both the questions asked by scientists and the answers they propose are theoretical. He repeatedly called a question doubt and an answer a belief. In this sense doubt and belief mark the beginning and the end of the scientific process of inquiry.

Peirce states that the whole function of thought is to produce habits of action (Reilly, 1970). However, action is the end of thought and not the purpose of thought. Effective action depends on the understanding of the situation.

Inquiry does not start automatically or at random. When doubt occurs as a result of an unexpected outcome, the process of inquiry starts.

OBSERVATION

The first stage is to look for explanations for the unexpected outcome by observing nature. Observation is perception which is based on thought and analysis and is much more than a vacant stare at nature. It is *"an act of voluntary attentive experience usually with some, often with great effort."* (Reilly, 1970, p. 28).

Experience is the beginning for all our knowledge since all our knowledge is based on what we have observed. The inquirer will begin his scientific work with a background of experience which will act as part of his next experience. The doubt arises as a consequence of the contrast between a habit of experience and an unexpected event. The outcome differs from what he expected. This expectation, or predicted outcome is based on previous experience in perceived similar situations.

ABDUCTION

The next stage that follows logically is to form an explanatory hypothesis to explain the unexpected phenomena. The function of this explanatory hypothesis is to provide a proposition that, if it would have been known prior to the phenomena occurring, it would not have caused doubt. Further to this, a hypothesis can be proposed as a possible or even likely explanation of the unexpected experience.
Peirce uses the term ***abduction*** to designate the mental activity by which the explanatory hypothesis is formed.

Abduction provides the inquirer with a problem solving theory or explanatory hypothesis, which will be verified during the next two stages of the process. Abduction concludes with a case inferred from a known rule and a known result through a process of analytical inquiry. The hypothesis is proposed as a possible or even likely explanation of experience without any perfectly certain conclusion.
The theory of abductive reasoning can be demonstrated with the following example:-

Figure 6 **Abductive Reasoning**

RESULT	THE ROOM IS COLD
RULE	A HEATER THAT DOES NOT WORK CAN CAUSE A COLD ROOM
CASE	THE HEATER MAY NOT WORK - LET US CHECK TO SEE IF IT WORKS

The observation is made that the room is cold. Because it is winter and the buildings are expected to be warm inside, the observer is surprised. He then goes through a process of scientific inquiry as to why the room is cold.

From past experience he knows that the rooms are normally heated by some heating device during winter.

If the heating device is not working it would not be able to provide the necessary heat to the room.

He can therefore draw an inference that the heater is probably not working.

The explanatory hypothesis would then ask: "Is the heater working?"

He can now physically take action by checking whether the heater is working. If he finds that the heater is not working, the explanatory hypothesis is accepted to be true for this occasion.

If he finds that the heater is working the hypothesis is false for this occurrence. However this does not mean that the hypothesis may not be valid for another occurrence.

He would then go through a second cycle of formulating an alternative hypothesis and go through the same process until he eventually get closer to the correct hypothesis.

Alternatively he could formulate several hypotheses from the outset and then go through a process of elimination to find the most appropriate hypothesis.

Abduction is a unifying process where a great series of proposed causal elements, forming no unity in themselves, are formulated into a single one (or a smaller number). This unification process results in a simple but plausible explanatory hypothesis of the concern being investigated.

When we know that a certain group of objects has a certain set of characteristics, which can be used to classify these objects and we establish that a given object has the same characteristics, we can expect or predict that the given object probably belong to that same class. This is an instance of forming a hypothesis which results in an advance in knowledge if the hypothesis is tested positively.

The scientific explanation predicted by the process of abduction has two important characteristics.

1. It renders the observed facts necessary, or those which are highly probable. When the observer comes across an unexpected outcome, he examines it to establish if there are any aspects or characteristics present, which he can connect with some other conception that is already stored in his reference framework. This would then help him to explain the unexpected outcome.

2. It deals with facts which are different from the facts to be explained. It is frequently not possible to observe these facts directly, but it must be possible to draw inferences from it that would explain the unexpected outcome. The key issue here is that the inquirer must be able to verify the explanatory hypothesis at some stage for it to be meaningful.

When confronted with a number of possible hypotheses the following requirements can be used as a guide to choose the more appropriate one:-

1. It must be experimentally verifiable.

2. It must be possible to evaluate the probable hypotheses and screen some of the obviously unsuitable hypotheses, without needing to test them. The economies of money, time and energy i.e. the resource availability, must be taken into consideration during this screening exercise.

3. A good hypothesis for testing is one that, if false, can be disproved with ease.

4. The effects of the hypothesis on other scientific inquiries need to be considered. Ideally a hypothesis that is broad and inclusive should be preferred.

5. The value of the hypothesis in itself should also be considered whether it survives the specific test in question or not. The hypothesis can sometimes lead to the prediction of many crucial testable consequences and can therefore be more

thoroughly tested. Peirce calls this the idealistic character of a hypothesis (Reilly, 1970). When the selector finds it difficult to select the most appropriate hypothesis, it is normally better to adopt a hypothesis which leaves open the greatest field of possibility, or the one that requires the least assumptions to be valid. This implies that the hypothesis which adds the least to what has been observed, would likely be the more plausible one.

A hypothesis that is in accord with instinct, is far superior to one that is a reasoned or likely hypothesis. Peirce urges inquirers to trust the power of the mind to instinctively hit on the better explanation of observed facts (Reilly, 1970). This usually eliminates the possibility of pre-conceived ideas stemming from a priori speculation.

Further theoretical knowledge of abduction can be gained by looking at how it relates to perceptual judgment. Perceptual judgment can be described as the formation of a mental proposition concerned with the experience of the sense-image of the person making the judgment. It is therefore our first premises after observing some phenomena and can be seen as an extreme form of abductive reasoning. However, it usually only recognizes one of several aspects of the object being observed and is therefore less complete, if a rich understanding of the phenomena must be achieved.

There are four important similarities between perceptual judgment and the abductive hypothesis.

1. They both contain elements of generality.

2. Both are in some aspect beyond the control of reason, since neither judgment is the necessary conclusion of an inference.

3. A newness or originality is found in both perceptual judgment and an explanatory hypothesis.

4. They are both in some sense interpretative, although interpretation can occur in widely different ways in the perceptual judgment.

The question of meaning is linked to another theoretical aspect of abduction - Peirce's pragmatism. Pragmatism can in this sense be described as the logic of abduction because the pragmatist maxim is concerned with the admissibility of hypotheses.

There are three propositions summarizing Peirce's position on pragmatism and abduction.

1. Pragmatism proposes a maxim about the admissibility of hypotheses. If the hypothesis is not pragmatic, in other words if it does not have a practical application, it is not relevant and can be discarded.

2. This maxim is sufficient and renders all others without need. This implies that pragmatism is the only test that renders a hypothesis relevant; no other tests are required for initial admission as an explanatory hypothesis. This does not mean that all admissible hypotheses are equal in value and relevance.

3. In logic this is all the maxim of pragmatism pretends to do. It cannot interfere with what we expect experimentally when we physically confirm the validity of the explanatory hypothesis. It affects the predicted outcome only as a consequence of its effect upon abduction.

Pragmatism forces conception far beyond what is deemed practical. It allows any flight of imagination, with the one proposition, that this imagination ultimately alights upon a possibility of having a practical effect.

VERIFICATION

During the verification process the inquirer is trying to see how close his hypothesis comes to be true. After drawing certain experiential conclusions from the hypothesis, the inquirer proceeds by trying to see whether his predicted conclusions actually do occur in practice.

The following list proposes a set of rules designed to test the probability of a hypothesis being true:

- The hypothesis should be distinctly put as a question before starting the observations intended to test its truth.

- The test must be done on an occurrence which is randomly selected and not on one that is known to support the hypothesis.

- The failures as well as the successes must be honestly noted in a fair and unbiased way. It must be kept in mind that even a failure can make a positive contribution in the process of getting closer to the truth.

In his search for the truth the inquirer must be detached enough from his hypothesis as to make repeated attempts to refute it.

The testing of the explanatory hypothesis starts with the deductive phase.

DEDUCTION

Deduction in general, can be defined as the form of reasoning by which a specific conclusion is inferred from one or more premises. In valid deductive reasoning, the conclusion must be true if all the premises are true. Deduction is often expressed in syllogisms, consisting of a major premise, a minor premise and a conclusion. (Encarta, 1996)

The process of deduction, as applied in the Scientific Method, is an examination of the hypothesis and the gathering of experiential consequences which would follow if the hypothesis is true. The inquirer deduces experiential predictions from the hypothesis and watches for these predictions to become true. By deduction he draws virtual predictions of possible experiments from his hypothesis.

The main function of deduction is to explicate the hypothesis by drawing experiential consequences from the explanatory hypothesis. The key point is that the truth of the result is not reached through a reasoning process, but by experience.

The deductive process in a scientific inquiry must conclude with genuine predictions of the *"if-would"* variety.

Referring to the example in Figure 6, the deductive phase can be illustrated as in Figure 7.

Figure 7 Deduction

RULE (Major Premise)	**A HEATER THAT DOES NOT WORK CAN CAUSE A COLD ROOM.**
CASE (Minor Premise)	**THE HEATER IS NOT WORKING**
PREDICTED RESULT (Conclusion)	**IF HOT AIR IS BLOWN FROM THE HEATER IT WOULD BE WORKING.**

The prediction of the "*if - would*" type in this case, is that **if** hot air is blown from the heater it **would** be working. The inquirer can now physically feel whether hot air is coming from the heater and thereby testing the hypothesis.

Deduction can therefore be described as an unfolding of experiential consequence from an explanatory hypothesis or prediction of reality. Its main function being to explain the hypothesis by drawing experienced consequences from it.

In the deduction process the rule is the major premise, the case (or hypothesis) the minor premise and the predicted result the conclusion. The conclusion, or predicted result of this inference has no more certainty by virtue of the deduction than the hypothesis. The process will however render the hypothesis clear and understandable. The inquirer may analyze the class of the hypothesis and draw the characteristics of the class into clear view. However, for this to rank as a phase of the verification process, the characteristics which the inquirer chooses must be experimentally verifiable i.e. it must be observable.

The inquirer must now see if the predictions do come true by means of a practical experiment. This phase is called the inductive phase.

INDUCTION

Induction can generally be defined as a process of reasoning from the particular to the general. This is the inverse of the process of deduction, which was described in the previous section. The basis of induction is the assumption that if something is true in a number of observed instances, it will probably also be true in similar, but unobserved, instances.

The process of induction, as applied to the Scientific Method, occurs after the inquirer has deductively drawn inferred observable predictions from the abductively established explanatory hypothesis. The predictions are tested through a process of induction. Peirce states that it is not the fact predicted by the deductive process that necessitates the hypothesis to be true, but it is the fact that it has been predicted successfully (Reilly, 1970). Therefore the success of the prediction is evaluated by the inductive phase of the scientific method.

Induction is the process by which the inquirer scrutinizes nature to see if the predicted observable consequences of the hypothesis actually do occur. He then judges the hypothesis in terms of its ability to predict and from this evaluation he decides to confirm, modify or reject the hypothesis.

Using the example used in abduction and deduction, induction can be illustrated as in Figure 8.

Figure 8 Induction

CASE (HYPOTHESIS)	**THE HEATER IS NOT WORKING**
PREDICTED RESULT	**IF HOT AIR IS BLOWN FROM THE HEATER, IT IS WORKING**
TEST RULE	**THERE IS NO HOT AIR BLOWN FROM THE HEATER**

The hypothesis states that a possible cause for the room being cold is that the heater is not working.

In order for the inquirer to confirm the validity of this hypothesis, he asks whether the heater is working.

By deduction he predicts that a test to establish whether the heater is working, is to feel whether hot air is blown from the heater.
By physical observation the inquirer holds his hand in front of the heater and confirms that there is no hot blown from the heater.
The inference can now be made that the hypothesis is true; the room is probably cold because the heater is not working.

Induction can evaluate the proximity of the theory to the facts and can thereby serve as a basis for a more satisfactory theory. Verification can thus be seen as not only the evaluative judgment, but it also possesses a self-correcting function. If the hypothesis is rejected, it forces the inquirer into another loop of reformulating the explanatory hypothesis and testing it through the deductive and inductive phases. This loop can be repeated, until a satisfactory explanatory hypothesis is found for the unexpected phenomena.

In some cases it could even require the belief or mental model to be revisited.

There are two principal requirements for any scientific induction.

- The character for which objects or events are inductively tested must be pre-designated. The inquirer must determine what he is going to test for, before he actually begins the test.

- The inquirer must collect a fair sample of the objects for testing. The objects tested must therefore be representative and must exhibit the same characteristics, in approximately the same ratio, as the whole class from which the sample has been drawn.

The inductive process consists of three parts:

- Classification

  The inquiring mind engaged in a process of scientific induction, performs first of all an operation of classification by which general ideas are attached to objects of

experience. The singular experience will present itself to the observer as something meaningful when it takes place. Meaning is always general. When a prediction is made of the expected outcome, the inquirer has not yet experienced the individual predicted events. However, he knows what sort of outcome he should find if the hypothesis is true.

- Probation

  When the conditions of the prediction are fulfilled, the inquirer performs what Peirce called the operation of inductive probation (Reilly, 1970). The inquirer should observe the number of times the hypothesis has predicted successfully. In some cases this can be achieved by just counting the instances of equal value - this is called quantitative induction. In other cases this would not be enough and an additional estimate of the importance of the various characteristics under investigation will be required - this is called qualitative induction.

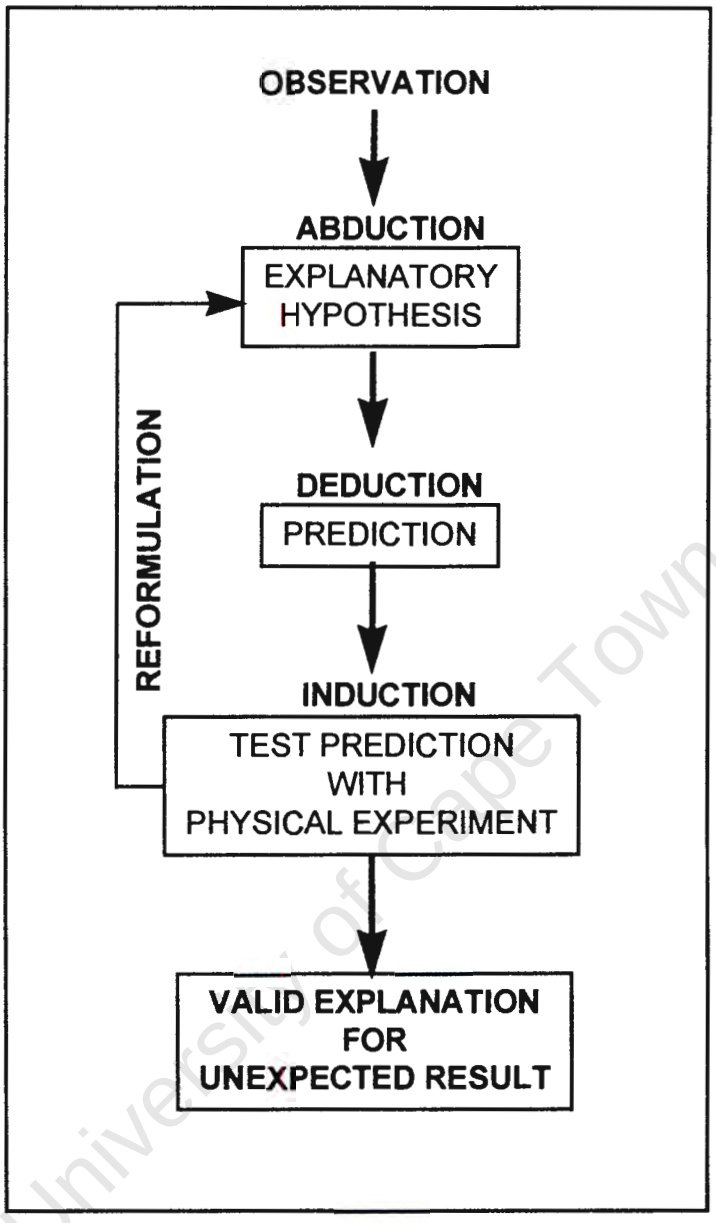
  These methods are similar in that they both lead to probable conclusions and both effect a closer and closer convergence on the truth without ultimately fully reaching it.

- The sentential part of induction.

  The whole inquiry will be wound-up with the sentential part of the inductive process that appraises the different probations by inductive reasoning. This appraisal is done on the probations singly and then in their combinations. After these appraisals have been completed, it does a self-appraisal of the appraisals themselves and then passes final judgment on the whole result.

The flow of the Scientific Method can now be illustrated in Figure 9 indicating the reasoning processes which are followed through each phase.

Figure 9 The Flow of the Scientific Method



The development of the scientific method resulted in the development of a comprehensive underlying philosophy - **Pragmatism**.

MANAGEMENT AND THE SCIENTIFIC METHOD

EXPLANATORY NOTES

Field studies which flowed from the first action learning studies done at Manchester College of Technology revealed a parallel between decision taking and the scientific method. (Revans, 1982)

The scientific method, as discussed in the beginning of this chapter, consists of five major steps:-

- Observations of the external world to gather information to assist us in giving meaning to certain phenomena.

- The formulation of theories based on these observations to explain why certain phenomena occur.

- The design and conduct of experiments to test the validity of these explanatory theories.

- A comparison of the experimental results with the results predicted by these theories.

- The rejection, modification or confirmation of these theories in accordance with the outcome of these comparisons.

Neither the definition of these five steps nor the arguments based upon using the Scientific Method can ever be strictly accurate. However the theory cannot be rejected if the results of the experiments to test these theories are randomly distributed about predictable means.

There is also a parallel between science and industry. If the five steps of the scientific method are applied to a technological product instead of a scientific theory, the five steps would then be (Revans, 1982):

- **Survey** - Determination of needs and an assessment of the extent to which these needs have already been fulfilled. This step can also include a screening and classification of the needs in terms of their relevance to our business.

- **Policy** - Decision about which of these needs we can and want to satisfy and to list what is required or should be done to fulfill these needs. This requires the selection of the product that must be produced to meet the requirements of all the stakeholders.

- **Operations** - The establishment of methods of how it will be produced. This would include identifying all the resources required, a schedule, a profit plan, etc.

- **Inspection** - An audit process of the product. This consists of the measurement of the extent to which our product or actions have met the customer's needs as well as our own expectations. At this stage we compare the actual achievement against the planned achievement.

- **Control** - Modification to improve the product. The experience gained through this process now forms the basis on which we review our actions, or the design of the product to improve it or to expand its ability to satisfy the customers' needs.

Karl Marx and two well known pragmatists, William Jones and John Dewey stated that there is no theoretical knowledge (Revans, 1982). They said that all knowledge is merely our ability to make things. If we can make things more or less as we forecasted we would make them, our knowledge is true and vice versa. The truth is therefore a mere statistical concept.

The extension of the 5-step scientific method into the field of practical action defines the nature of rational behavior or response in a particular context. In this particular context it is the fulfillment of some pre-determined need by following a pre-determined strategy.

The validity of the definition is therefore not dependent on which actual method is followed. It is a mere statement of the intelligent intended fulfillment of a human need.

The practical application in management practice can help us in extending the familiar concept of management by objectives (MBO). It provides us with a rational framework to work towards some clearly defined objectives and then measuring the extent to which these objectives have been achieved. These measured results are then utilized to reformulate our methods and not necessarily our objectives. In the Western application of MBO the tendency is to reformulate the objectives if the required results are not achieved.

The Japanese developed a management system called ***Hoshin Kanri*** (Management of the bright object), which is essentially based on MBO. The focus, however is on measuring and reviewing, rather than just setting the objectives.

We can draw a parallel between the Scientific Method and the Hoshin Kanri process by looking at the basic steps of the Hoshin Kanri process as follows:-

The first step is to identify those key factors (*bright objects*) that form the backbone of your business or function based on observation and experience.

The next step is to formulate what the Japanese define as ***measures*** that need to be managed and controlled. A specific ***target value*** is set for each *measure*. These targets must be achievable, but more important, the idea is that if you achieve these targets, it is an indication that you are managing your business or function successfully.

The next step is to identify specific ***activities*** that need to be in place to support the achievement of the *measures*. The progress towards success of these activities are reviewed regularly (monthly) against specific ***control items***, which are reported in a graphical format.

This is followed by, what is regarded by the Japanese as the first of the most important two parts of the process, a review of these results. The strengths and weaknesses are identified as well as the actual performance against the targets.

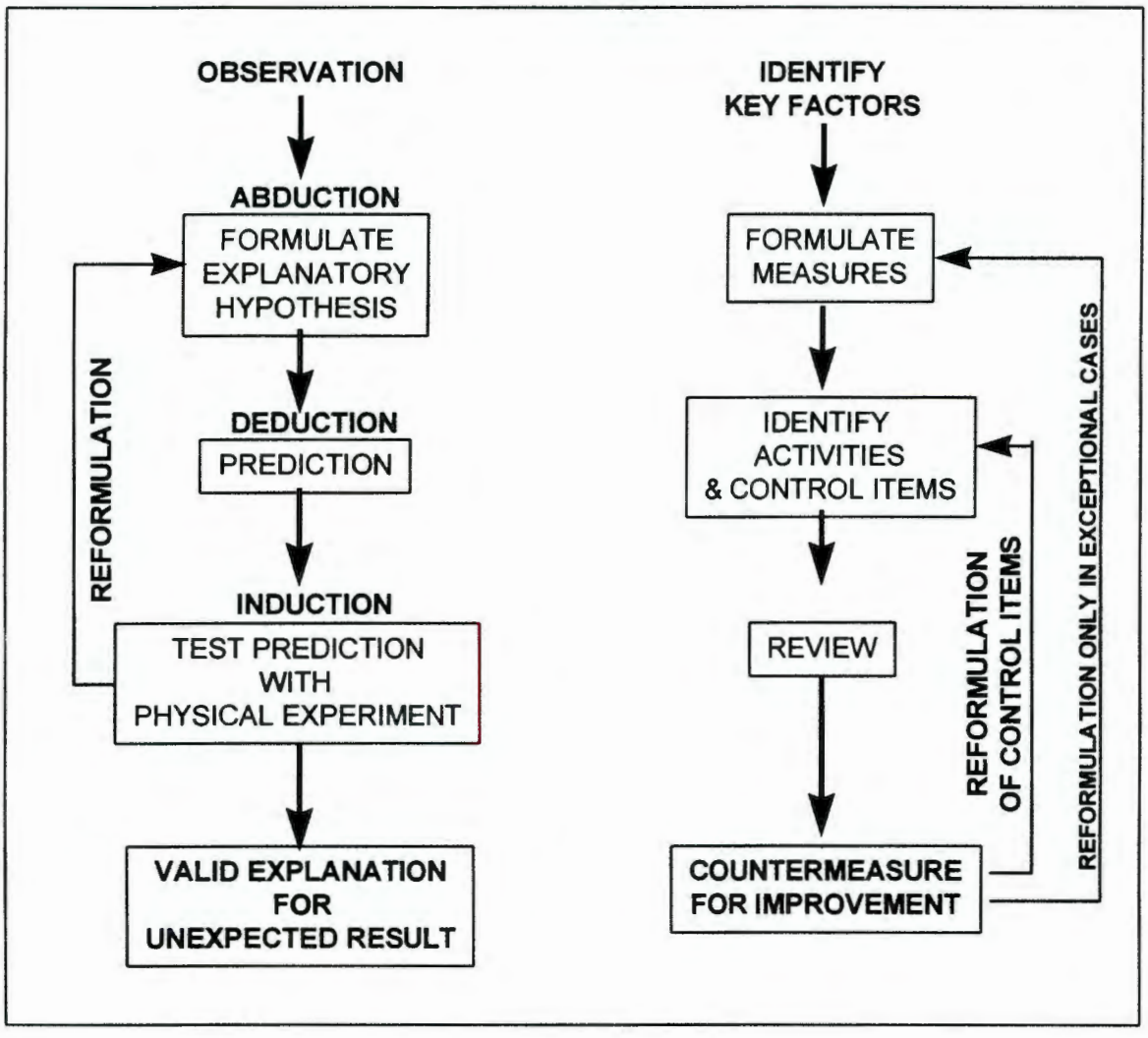
The final step in the process is to develop countermeasures to address the weaknesses and to use the strengths to enhance the whole process. This is normally achieved by revising the control items to ensure the most relevant aspects are measured. Sometimes it is required to change the activities if they do not support the *measures* sufficiently. The measures are only reviewed if they are no longer a key factor or if they are so consistent that they do not require any detail management attention.

Figure 10 schematically illustrates a comparison between the Scientific Method and the Hoshin Kanri process.

Both these processes are cycles or loops that, if rigorously followed and recycled enough, will lead us closer to the ultimate solution. They both can be cascaded down into lower or higher recursion levels.

This then implies a cycle within a cycle to enable us to apply the Scientific Method to the detail of every detail. The Scientific Method proceeds indefinitely, like a recurring decimal or a continued fraction i.e. a constant verification of the actual outcome compared to the expected outcome to confirm a stable belief.

Figure 10 A Comparison between the Scientific Method and Hoshin Kanri.



The management process can be regarded as a practical parallel to the scientific method if it is analytically pursued. The scientific method sets out to test a new theory by comparing the observed results with the predicted results. However the management process sets out to test how far the results of the planned actions compare with those forecasted by its policy. It must be stated that the forecasts and predictions of a management process can at best only be statistically true. The manager will thus have to contend with variations that would normally be intolerable for most observational sciences - **this is the "art" of management!**

Revans rightfully states that **it is the sum of art and science that makes the manager** (Revans, 1982).

JUDGMENT AND HUNCHES

In most instances the facts on which management has to base its policies appear to be inadequate - at best! As a result of this situation many people attribute successful selection of policy to a good hunch. It is the responsibility of the modern manager to develop a logical plan to arrive at decisions and not rely only on chance - he will thereby not make the correct decision every time, but he will at least improve his "batting average".

A successful *"hunch"* using managerial judgment needs to transient all the available data and information at hand. If this data is sufficient then a valid *"scientific"* hypothesis could be determined.

Good management practice is therefore merely the application of the Scientific Method to the field of conscious achievement. Management is a method of applying existing knowledge and deciding upon action and setting standards by which the results of its action shall be judged.

Formal instruction in tool subjects i.e. cost accounting and work measurement provides command of the field of factual knowledge. The Case Study method assists to develop the indefinable powers of judgment.

Revans (Revans, 1982) states that neither formal instruction in tool subjects, nor directed arguments over case-studies are deemed to be substitutes for practical experience, they are proclaimed to be no more than aids for its interpretation.

Therefore a good experienced hunch or gut-feel can be based on practical experience and the managerial ability to consider the probability that a specific outcome will follow a specific course of action and at the same time be well aware of the extent of the risk of failure. At the same time he can also be applying the elements of the scientific approach where possible. **A good hunch would therefore become a better one.**

It would however be wrong to divide the field of studying management science into two distinct regions - one consisting of a factually knowable science of tool subjects. The other a minefield of transitory shadows depending on continuous exercises in subjective qualities like judgment, foresight, tact, leadership and other "soft systems". The acceptance of such a division would support the generalized perception that management cannot be practiced from a scientific base. It would only serve to divert the attention from a task of which the performance would yield valid results.

FUND OF PREFERRED VALUE

Nature does not consider whether her laws are perceived by the human mind as intrinsically elegant or moral or beautiful or conforming to any other human expectations and/or norms. What we commonly accept to be a law of nature is simply our specific way of looking at nature (Weltanschauung). If we choose a different standpoint we may see a relationship that is not merely untidy, but also quite unintelligible.

However there remains a sense in which the practical counterpart of the Scientific Method used to simulate the processes of rational management, needs to consider certain human values. Scientific processes are initiated by human beings to fulfill specific human ends, while the relevant values of the processes themselves are irrelevant. Only the sequence of management processes which appears to increase the value of the specific individual's or group's choice will be set in motion. In practice, the fact that only those activities that will increase some fund of preferred value will be instituted, limits the range of possible actions. The array of the processes that would fulfill the fivefoid pattern of the Scientific Method under the same circumstances, is much wider.

Management usually has a fairly clear conception of what they consider to be the directions which will bring the greatest benefit to the firm as a whole. When Managerial decisions are taken and processes adopted to suit "the best interest" of the company, it is important that these objectives should be stated in clear and unambiguous terms. This should be well understood by at least the senior staff members to enhance effective coherence in the organization.

DECLARATION OF PREFERRED AIMS

Behind every situation in which management needs to take decisions there is a set of preferred objectives which aim at maximizing some benefit or gain. It does not matter whether these benefits or their order of importance are formally contained in some company policy or whether they are established on an ad hoc basis as required. The member of the management handling the situation should know how much he expects to gain or how much can be sacrificed in the short term by any decision that he makes. He should be able to list these preferred gains or losses in terms of the major operating factors with which he is concerned. He should be able to arrange these preferences in some rank order which would form a simple statement of the relations between the operating factors generally desirable in the firm. For convenience this ranked expression can be called "the declaration of preferred aims". It is important that the ranking should not only consider the financial benefits to the organization.

This ranked expression has to be made for each alternative decision the decision maker has to make. The various ranked expressions can then be compared and the specific action that supports the preferred values the best, can be adopted. This comparison can be done in a tabulated format to ease the selection process. During the comparison process various views can be obtained from stakeholders and the resulting input used to adjust the priority ranking in the table.

In some cases it may be necessary to change either the preferred aims or the proposed methods of achieving it after the completion of the comparison process. This process of re-iteration will result in a continuous interaction among the intellectual processes and may lead to a more rigorous search and interpretation of the available data.

This in essence is the five-fold cycle of the Scientific Method.

After the first stage of observation the declaration of preferred aims constitutes the second stage. Developing the alternative proposals for achieving these aims, forms the third stage. The comparison of the alternative results with the preferred aims is the fourth

stage. The subsequent confirmation, modification or rejection of the proposals forms the fifth stage.

THE VALUE OF THE SCIENTIFIC METHOD

It can be argued that this analysis is a mere deceptive elaboration of something which is essentially commonplace. However, management situations are frequently very complicated. Those who attempt to manage these situations are often confronted with an ever-changing situation and with limited available information.
It can therefore only benefit management to collate all the small bits of information to squeeze out the greatest likelihood of a correct decision. This can be achieved by applying the Scientific Method with the utmost rigor.

Finally, the Scientific Method is merely a model built out of thought in the same way that thoughts themselves are models built out of consciousness. Models, like thoughts are sometimes useful to pave the way of the future, based on the lessons learnt from the past.

REVANS - THE MANAGERIAL ALPHABET

Revans (Revans, 1982) states that the behavior of an enterprise as a total entity is determined by the most powerful coalition inside it. In managerial terms we may say that the first task of the coalition is to constantly review its goals and the second is to direct the enterprise towards them. The two main tasks can therefore be seen as a **process of design** and a **process of negotiation**. This emphasizes why excellent managers are necessarily rare, as they need to be endowed in two independent qualities - intellectual for design and emotional for negotiation. In addition to this he also needs the capacity to be changed by the experience as a result of the processes. He must therefore not be so absorbed by the major objectives that he has no regard for change in the situation in which the organization functions.

Revans (Revans, 1982) states that those who influence the world must in their turn expect and be willing to be influenced by it. Simplistically seen, every enterprise is a collection of things to be done, opportunities to be grasped and problems to be resolved. The problems can be categorized into three levels - strategic, tactical and technological.

MANAGERIAL TASKS

Aspects of Design

A decision is a statement of a manager's belief in the feasibility of some future cause of action. A feasible cause of action demands the following:

1. An evaluation of the outcome of the action

   What needs to be done?

   What will the consequences of this decision be for all the stakeholders?

   What am I hoping to win?

   The extent in which this evaluation will be carried out depends on the level or the scope of this decision in terms of the resources it would employ (Manpower, Money, Management and Machinery) and the consequences for the organization as a whole. It can be done by means of a scientifically executed Failure Mode and Effect Analysis (FMEA) or a simple statement of consequences.

2. An awareness of the difficulties that he will need to surmount to achieve the planned outcome.

   What can prevent it from being done?

   What is the particular chance now being offered for winning it?

   Once again, the level of the decision will determine the level of detail and depth in which the manager will investigate the possible difficulties that he will face. In complex situations or decisions of strategic importance, the FMEA can be utilized with a great deal of success. In lower level decisions a verbal review may be sufficient.

3. Enough resources to deal with these difficulties at a cost consonant with the outcome.

   How can these obstacles be overcome?

   How do I make the most of this chance?

The overall benefit to the organization should not be outweighed by the resources that need to be employed to ensure success. A simple rule of **return on effort!**

Adequate knowledge and information of the above mentioned demands must be seen as a given, before the decision is even considered.

When evaluating managerial values related to the external system the role and needs of all the stakeholders need to be clearly understood. The relationships between these stakeholders and the extent to which they interact must also be understood.
The design of a management system or strategy primarily demands information about 3 critical elements:-

- The value system of the managers.
- The external system which they exploit in terms of threats and opportunities.
- The internal system by which they exploit it. This would take cognizance of the available resources in terms of manpower, money, machinery and management ability.

The structured interplay of these three sets of information is the design process of a management strategy. This is defined as System Alpha. System Alpha is universal and should be used by decision makers at all levels in the company to design their strategies.

Figure 11 can serve as an example of the System Alpha paradigm.

Figure 11 **System Alpha** (Revans, 1982, p. 333)

DESIGN ELEMENT	FACTORY WORKER	FACTORY OWNER	OPERA SINGER	BOARD OF DIRECTORS	GROWING NATION	RESEARCH LABORATORY
VALUE SYSTEM	Own earnings	Profits: Honors list	Fame	Dividends growth	Imperialist ambition	Scientific reputation
EXTERNAL SYSTEM	Labor Market	Customer needs: Political machine	Audience: Critics	Market	Weak neighbors	Unsolved problems
INTERNAL SYSTEM	Craft skills: Trade Union membership	Men and Machines: Services rendered	Voice: Publicity agent	Assets: Take-over skills	Superior armaments	Skills and apparatus

Aspects of Negotiation

The information gathered through System Alpha are manipulated through a negotiation process. The methodology and techniques used are the study field of operational research and should be part of the armory of any top manager. It will therefore not be discussed in this dissertation.

The cycle of negotiation is referred to as System Beta and can be described in terms of five stages:-

1. A survey stage of the 3 design elements of System Alpha. This survey will be done of all the relevant data that is available of the value systems of the stakeholders and the internal and external systems that are relevant to the situation.

2. A trial decision stage to select the most suitable design in terms of System Alpha, in which the design that has the most probable chance of success, can be selected.

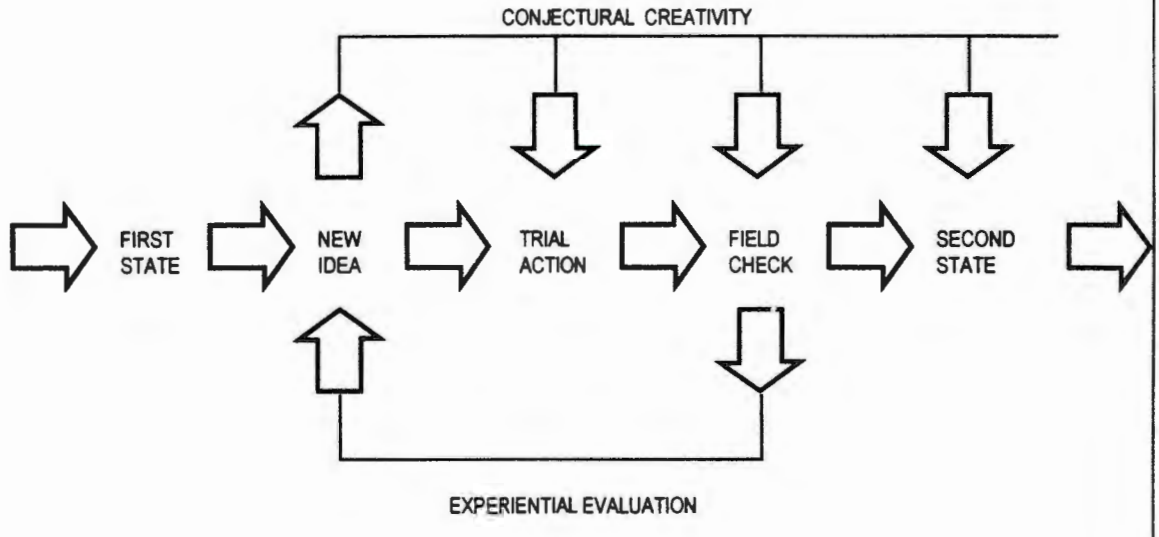
3. An action stage in which the selected design is implemented on a trial basis, in reality or by simulation.

4. An inspection or audit stage to compare the outcome of the trial to the initial expected outcome. This implies that the expected outcome was articulated in some way and that some form of measurement can be applied to confirm success.

5. A control stage where action is taken based on the experience gained from the first trial application. This can be to confirm, modify or reject the first design or to initiate another cycle of negotiation.

System Beta provides the underlying logic of the fundamental process of intelligent trial and error and thus appears in three common processes - the Scientific Method, the rational decision and the learning process.
Figure 12 illustrates this more clearly.

Figure 12 **Using System Beta** (Revens, 1982, p. 339)



Assemble data	Propose theory	Perform experiment	Compare results	Evaluate theory
Survey a fresh field of interest	Form own policy	Act on policy	Inspect or audit outcomes	Confirm or reject policy or adviser
	Seek advice	Follow advice		
Review knowledge	Infer new relations	Try out in practice	Assess effects	Remember or forget

The logic of System Beta is similar, if not identical to the logic of the process of the Scientific Method as well as that of the rational decision and the learning process.

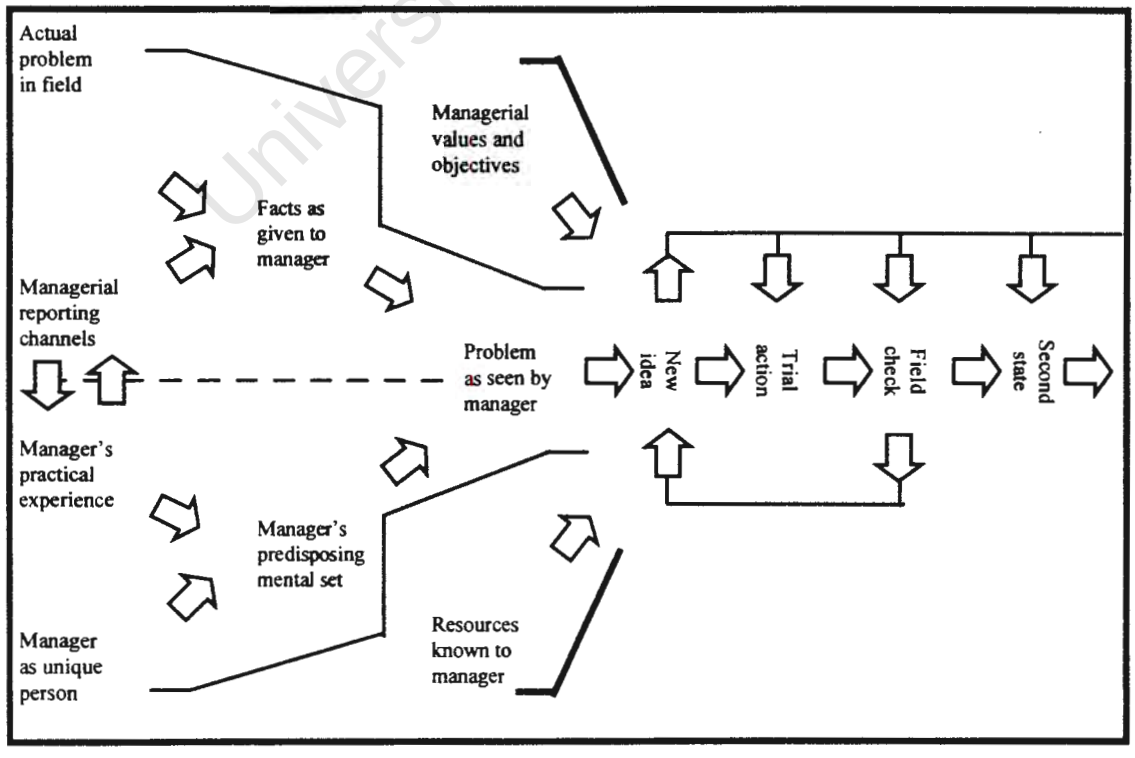
Revans (Revans, 1982) attempts to integrate the first stages of System Beta in terms of System Alpha and the specific manager that is directly involved as an individual in the process.

When an actual problem is reported to the specific manager, he recognizes it in terms of the actual information reported to him through the managerial reporting channels. His interpretation of the information is influenced by both his practical experience with these reporting channels as well as his personal experience as an individual. This interpretation is then integrated with the other System Alpha elements - the managerial values and the resources known to the manager. He then proceeds through the logic of System Beta to formulate interventive action to resolve or address the actual field problem.

Revans (Revans, 1982) calls this symbiosis of the manager as an individual and the manager as an element of the organization, System Gamma.

The process is graphically depicted in Figure 13:

Figure 13 **System Gamma** (Revans, 1982, p. 346)



CHAPTER 6

This chapter describes the other theories and methodologies which are used in this dissertation. It starts of with a discussion of the theory of learning as described by various authors. The writer's understanding of Single- and Double-Loop learning is briefly discussed.

The chapter continues with a brief discussion of the PDCA cycle, which is widely used by Japanese Companies.

A practical view of Peter Checkland's Soft Systems Methodology is given with the view on its application in planning the implementation of change in the organization.

This is followed by a description of the Viable Systems Model as a useful tool to clarify roles and functions in the organization.

The principles of performance measurement are illustrated.

The Human Performance Technology is discussed with a view of its practical application in the successful implementation of change in the organization.

The chapter concludes with a description of Work Systems and its practical application in strategically positioning functions in the organization.

OTHER THEORIES AND METHODOLOGIES USED IN THIS DISSERTATION

THE THEORY OF LEARNING

MUMFORD - LEARNING STYLE AND LEARNING SKILLS

The context of management development has been reframed and the following statements are generally accepted as being relevant and useful to conceptualize the principals (Lecture notes, 1996).

1. The realities of managerial life have very little to do with text book theory of what managers should be doing. The classical definition of what managers should be doing is Planning, Organizing, Staffing, Leading, and Controlling (Koonz, 1980).

Unfortunately this definition is very vague and too generic. In the rat race of industrial society, the manager finds himself in an environment of continuous change, new challenges and less time to rise to these challenges.

2. Most learning for most managers most of the time occurs from the process of doing a job. In most cases the learning passes without even being recognized as such. The frequency at which this learning takes place is mind boggling, yet it passes without even being noticed.

3. The contribution of classroom learning without experience is limited, due to the fact that these courses are mostly highly experimental and sometimes over-simplified. The real learning only takes place once the theoretical knowledge is applied in a practical situation.

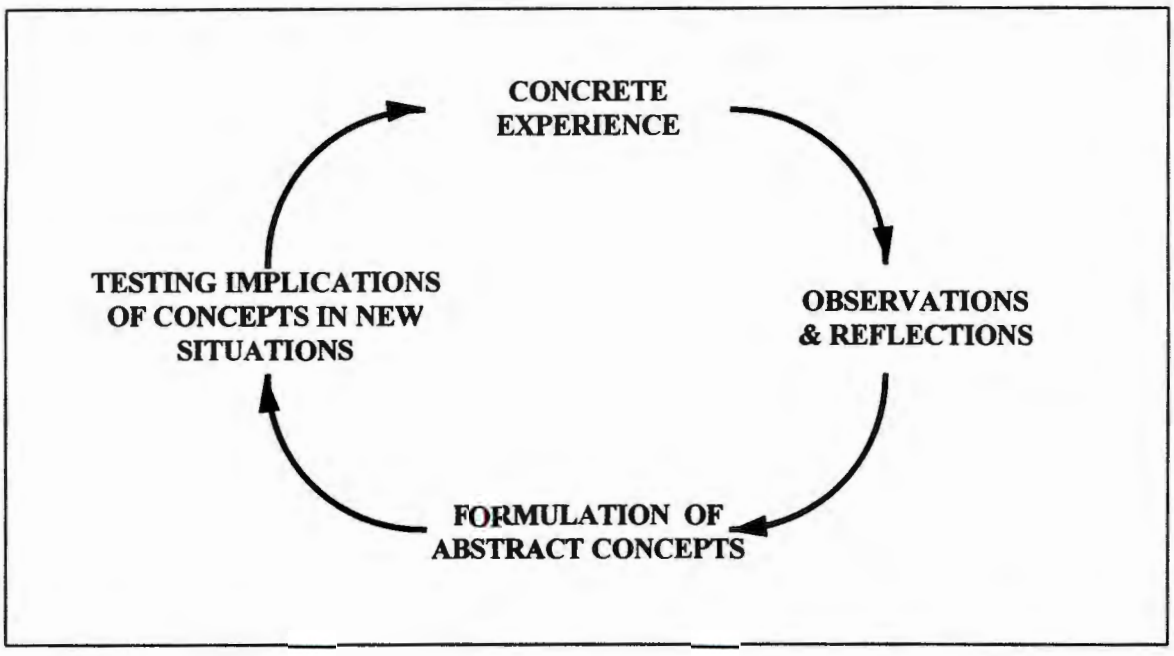
In an attempt to define learning styles Mumford refers to Kolb's Circular Learning Pattern (Lecture Notes, 1996).
Kolb states that an experiential theory of the learning process follows a sequence beginning with a here and now experience. For the process of inquiry to start and by implication for learning to take place, this experience must be different from what would be the norm.

This experience is followed by the collection of data and observations about that experience - the immersion phase. The learner relies on past encounters of a similar nature and information which is readily available, to make sense of the experience.

The process continues with an analysis of the gathered data and the formation of some abstract concepts to understand and explain the experience.
The final stage of the process is an intervention which results in the modification of behavior, or a revision and fixation of belief if the situation requires it. This may be followed by a new experience which gives a different result and the learner proceeds through another loop.

Kolb's theory can be illustrated graphically as shown in Figure 14.

Figure 14 Kolb's Circular Learning Pattern



With the objective of developing a practical method of identifying which learning opportunities might be more or less relevant for specific individuals that required to be developed, Alan Mumford has developed descriptions of different learning styles (Lecture Notes, 1996). He categorizes individuals into 4 categories in terms of their response to learning.

These categories are:-

1 **Activists** - those who enjoy the here and now and are dominated by immediate experiences. They thrive on short term crisis situations and the challenges of new experiences. However they are bored quickly with implementation and long term consolidation. They probably lie in the innovation domain and would most likely generate hypotheses but will not test them! The reader is referred to the statement I made when discussing MBO in the previous chapter. The reference was to the Western tendency to be keen on setting objectives and ever so keen to set new objectives if the previous ones were not achieved. They are however not diligent in reviewing the results and then, through a pragmatic process as suggested by the

Japanese Hoshin Kanri process reformulating the activities in order to achieve the original objectives or *measures*.

2 **Reflectors** - They tend to stand back and ponder and consider multiple perspectives of experiences and observations. They can set off on an excursion of analyzing just for the sake of analyzing without any urgency for some action to be taken to address the concern at hand. They tend to be cautious and would probably lack the ability to challenge existing situations for improvements.

3 **Theorists** - Another description of these people could be traditionalists - they like things to be tidy and fit into rational schemes, thereby giving them a resistance to testing set hypotheses due to a fear of unbalancing the situation. They are normally keen on basic assumptions, principles and theories.

4 **Pragmatists** - These people constantly search for new ideas and will experiment with their application at the first opportunity. Problems become a challenge and are actively recognized and pursued. The basic philosophy being that action without practical value is not relevant and would not be pursued. On the other hand, they are the people that will make things work and practically apply theoretical concepts which they determine to be of practical value.

The practical use of being aware of the different learning styles lies in its value to make a manager aware of his own particular learning style as well as those of other stakeholders that he needs to interact with. This can be very useful if used in conjunction with the theory of multiple perspectives, during the planning of articulating new ideas to the stakeholders.

It can also contribute towards enabling the manager to understand the stakeholders' responses to specific situations better.

HANDY - THE WHEEL OF LEARNING

Handy adapted Kolb's learning cycle to articulate his principle that the theory of learning is continually asking questions and solving problems (Handy, 1996). It is therefore not just the transfer of knowledge in a parrot fashion, as is practiced in many schools and other so called "institutions of learning.".

Before I continue with the detailed discussion of Handy's Wheel of Learning, it may be worthwhile to state the following facts about learning:

- It is not just knowing answers. To merely know the answers to specific questions does not automatically imply that real learning has taken place.

- Learning is not the same as studying. Studying is a process whereby existing knowledge is memorized for the sake of memorizing it. No new knowledge is generated in the process.

- It is not measured by writing tests or examinations. These just confirm your short term capacity to remember facts.

- It does not happen automatically; it requires a great deal of effort, energy and courage.
- There is a misconception that learning is only for intellectuals. This probably stems from the traditional definition of learning, as found in most dictionaries, that learning is to acquire knowledge.

- Real learning is not finding out what other people know, but solving our own problems by applying what we know.

Handy sees learning as a wheel divided into four parts (Handy, 1996). He uses the concept of a wheel to imply that learning is a continuous process where answers to questions generate new questions.

His wheel starts with a question. This can be as a result of a problem that needs solving. He puts a rider on this question - He states that this question should belong to the inquirer, because if it is someone else's question, the process will stop with an answer without real learning taking place. The question should stimulate the need to explore within the inquirer.

The next part of the wheel is to investigate possible answers to the question. It is the stage where the inquirer reframe the question to find some common ground with his own frame of reference (Weltanschauung) in order for him to make sense of it. It is a stage of free generation of ideas and scanning the environment for clues to solve the problem.

The third part of the wheel is the testing stage. The ideas and proposals are only relevant if they can be tested in the reality of the situation. Those ideas that fail this test are discarded and those that pass it can be implemented.

The last part of the wheel is the one which is most often ignored or neglected. This is the reflection stage. This is the interpretation stage to stand back and establish why the answer is the right answer.

Handy emphasizes the fact that each cycle must be completed to have real meaning and relevance. The process of learning in this sense consists of elements which is reliant on output from its preceding activity, to transform into an output which is required by its succeeding activity. If any element is left out, then real learning can not take place.

Stimulators of Change

Handy realizes that it is very difficult to start the "Wheel of Learning" moving and even more difficult to keep it moving. He identifies three lubricants or stimulators that need to be brought into play for a successful start of the process (Handy, 1996).

1. He firstly identifies, what he calls a proper or responsible selfishness. The key lies in the fact that the learner must feel in charge of his own destiny by knowing what he wants and where he wants to go.

2. The second lubricant he identifies as a way of re-framing. This is the ability to see situations in different contexts or perspectives. This is very important as it unlocks the problems by giving the whole situation a new look. This implies connecting things that were unconnected or matching a need with an opportunity. It recognizes that what might be a disadvantage in one situation could be an asset or opportunity in another. To re-frame requires a great deal of creativity and a conscious effort and in most cases some luck, but as Gary Player, a famous South African golfer said, the more you practice - the luckier you'll get!.

3. Negative capability is deemed to be the ability to accept ones set-backs or failures and continue with the same desire to succeed. It is man's capability to live in uncertainties, doubts and mysteries. It is the acceptance that you cannot always be right but by continuously trying you will improve your "batting average".

Barriers to Change

Handy states that it is a lot easier to stop the process, sometimes without intent, than to encourage it. He identifies the principal blocks or barriers to change as follows:-

1. The **"they" syndrome** is an externalizing of ones own problems rather than to have an inwardly focused locus of control and accepting personal responsibility for your own future.

2. **Futility** or humility is the acceptance to stop inquiry in fear of being criticized or humbled - the fear of making mistakes. Learning can only start with a belief in oneself and development or enhancement of your negative capability.

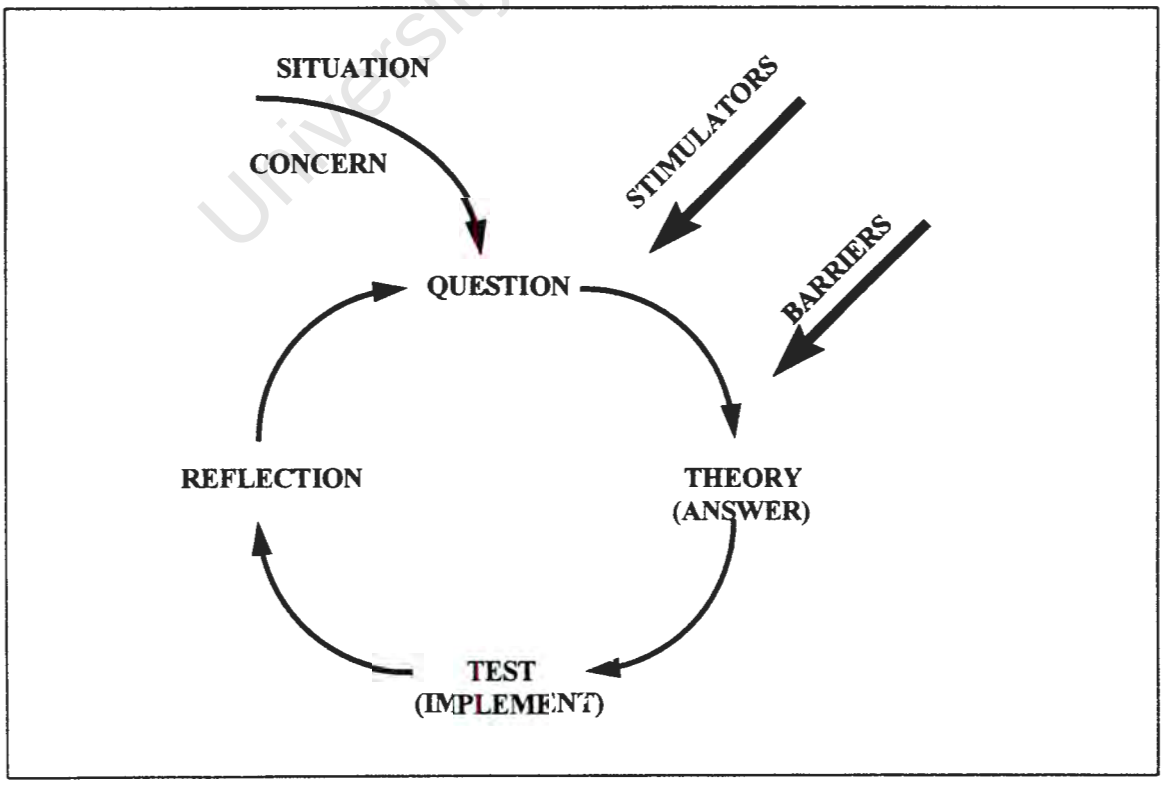
3. **Theft of purpose** is to remove someone's goal and force your own expectations on them. The effect it has is that it totally discourage learning by removing any incentives there are for the person to learn. This can be offset by a proper selfishness but still recognizing that your own goals need to be tuned in to the goals of the group or the organization.

4. The **missing forgiveness** is to not forgive a person for failure or mistakes. If you reward the good and ignore or forgive the bad, the good will occur more frequently. If this forgiveness is missing it tends to be stored as negative stamps and will put a damper on any intention of learning and creativity to develop new ideas or to try new ways to improve.

Handy suggests that a method to put the theory to work is to give yourself space, a purpose and goals to reach, questions to answer (Handy, 1996). He suggests that you should find some friends to be mentors, to walk in other worlds and not to be afraid to make mistakes.

Handy's *"Wheel of learning "* is graphically illustrated in Figure 15.

Figure 15 Handy's Wheel of Learning



DOUBLE- AND SINGLE-LOOP LEARNING

Chris Argyris and Donald Schön (Argyris, 1996) suggested that there are important differences between the meanings created when people espouse their views and when they act them out. Individuals are often unaware of these differences. They proposed that the source of meanings lies in the theories of action people use and not those they profess to hold. Many people in management positions are aware of new directions in management practice. They read about these new ideas and even attend seminars and workshops where specialists tell them about these wonderful new tools available to the modern day manager.

When they get back to their workplace, they immediately want to implement these ideas. They talk about it whenever they get the opportunity. After a few weeks, or in some cases days, the novelty wares off and they find out that it requires hard work and determination to successfully adopt these ideas. They now get into a state of mind where they know what they should be doing, but old habits are hard to abandon. They now move into an almost schizophrenic state of mind whereby they feel that they should act in one way but when it comes down to the physical action, they follow there old established habits.

Argyris and Schön (Argyris, 1996) further suggested that the learning systems of society reinforce these theories. Therefore, if sustained change in behavior is required, changes are required in the theories that the people use. Changes may also be required in the learning systems that the organization uses.

Argyris (Argyris, 1996) states that the reasoning processes people adopt, is fundamental to their theories of action. Reasoning processes are those activities by which we create premises, which are assumed to be valid and from which conclusions on how to act, are drawn.

Learning in an organization occurs under two conditions.

- Firstly it occurs when the organization achieves what it intended to achieve. The learning consists of the confirmation that a predicted outcome has been achieved. This implies that learning only takes place if there was some doubt in the first place

learning is not merely memorizing facts from a book, but the acquired knowledge must be applied for real learning to take place.

Both single- and double-loop learning are required by all organizations. The natural tendency would be to decompose double-loop issues into single-loop issues which are then much more easily programmable and manageable. Single-loop learning is more appropriate to the routine and day-to-day issues, while double-loop learning is more appropriate to more complex and longer term issues. Double-loop actions - the master programs - control the long-range effectiveness and therefore the ultimate destiny of the system.

Double-loop learning however does not occur readily due to the difference in complexity between single- and double-loop learning. Much of this stems from the gap between the espoused theories and the theories-in-use adopted by most people. Argyris and Schön created a model to describe the theory-in-use, which seems to be adopted by most individuals. They call this the Model 1 theory-in-use (Argyris, 1996). This model has the following four governing variables:-

- Strive to be in unilateral control. This is a general tendency with people in positions of power, especially in Western culture. Once in this position they do not wish to share their power with anybody. The view is that if you are not in control, somebody else is and you are being controlled.

- Minimize losing and maximize winning. Once again in typical Western way, there are only winners and losers and it is bad to be the loser. In some cases it is winning at all cost and once you've won, you must let everybody know about it.

- Minimize the expression of negative feelings. People tend to steer away from situations where negative feelings must be expressed. This relates back to the winning or losing principle. Negative feelings are associated with losing and should not be brought into the open.

- Be rational. Although this may not always be possible, people will always try to instill the perception of rationality.

Along these governing variables is a set of behavioral strategies such as:-

- Advocate your views without encouraging inquiry. In this way you may succeed to remain in control for a longer period because people may not necessarily notice it.
- Unilaterally save face - your own and other people's. Thereby you will steer clear of upsetting people or making them defensive.

Argyris and Schön (Argyris, 1996) hypothesize that Model 1 has been learnt through socialization. The thrust of their analysis is that human beings have theories-in-use that make it likely that they will inhibit their own and others' double-loop learning. People are largely unaware of these theories-in-use and both the unawareness and the counterproductive actions that stem from it, are due to highly skilled, internalized tacit automatic reactions.

They state (Argyris, 1996, p. 27): *"Human beings are said to be programmed to act automatically and tacitly in ways that are counterproductive to their espoused theories and to the advice they give others. They are not unaware of the inconsistencies in others' behavior, but they are programmed to withhold feedback on this lest they are held responsible for upsetting others."*

Argyris suggests that organizations can be helped to double-loop learn by adopting a staged process consisting of the following steps:-

1. Help individuals to become aware of their Model 1 theories-in-use and automatic reasoning processes that lead to counterproductive skilled responses.

   By doing this it creates an awareness, which can result in a conscious effort to rectify this as and when it occurs.

2. Help them to see how they create and/or maintain features in the learning systems which feed back to sanction Model 1 theories-in-use. They are then able to recognize immediately when they enact Model 1 theories-in-use and thus also identify the defense mechanisms that are built up over time to step around these issues as and when they occur.

3. Help individuals to learn a new theory of action that can be used in a manner that it has not only become an espoused theory, but that it is also a theory-in-use. This requires a lot of dedication and concerted effort, as it is easy to fall back in the old habits of doing things.

4. Introduce their new actions into the organization and simultaneously help others to learn them too. It becomes much easier to sustain this effort, if this behavior becomes the norm in the organization.

He states that there are two implicit assumptions in this process that need to be made explicit.

- The first is that intervention should begin at the highest levels of the organization to assure themselves and the rest of the organization of their serious intent to learn new theories-in-use and to create new learning systems. Too many good ideas get lost because they are no longer the flavor of the day in the top executives circles of the organization. Once the top executive buys into the process and actively promote its implementation, it will hopefully remain fashionable until it can become a part of the day to day way of operating in the organization.

- The second is that double-loop learning should begin at the individual level and then spread to the organizational level. If it is expanded too soon across too wide a spectrum, it loses the focus that is required to diligently and rigorously practice it until it automatically becomes the theory-in-use.

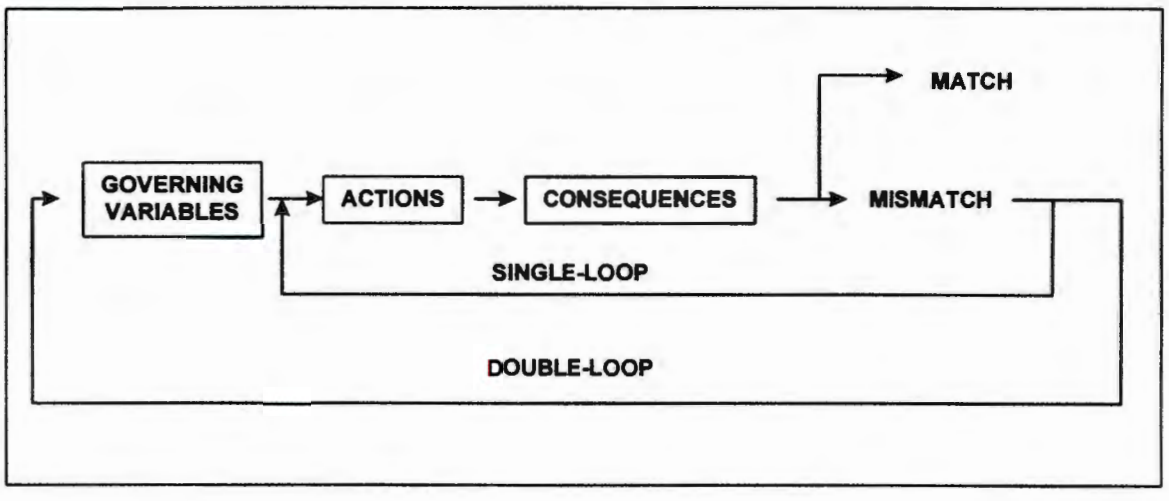
as to whether the expected outcome would be achieved. If the same result is achieved under the same set of circumstances repeatedly, no new knowledge is added and therefore learning does not occur any longer with regard to the specific scenario.

- Secondly, learning occurs when a mismatch is identified between the expected and the actual outcome and this mismatch is corrected. The same logic applies as in the previous paragraph. Once the mismatch has been corrected and it has been confirmed that the problem has been resolved, the learning process ceases until the next mismatch occurs.

Whenever an error is detected and corrected without questioning or altering the underlying values of the system the learning is defined as being single-loop. Double-loop learning occurs when mismatches are corrected by first examining and modifying the variables that govern the system and then adopting some corrective action.

Double and single loop learning are depicted in Figure 16.

Figure 16 Double- and Single-Loop Learning



From the diagram it can be seen that learning has not occurred until a match or mismatch is produced. This implies that although discovering problems and formulating solutions are important, learning in the organization only takes place when the formulated solution is actually produced. This supports the comments made earlier in this chapter that

THE PDCA CYCLE

The loop of inquiry also ties in with the PDCA cycle, which is used extensively in the Nissan SA shop floor environment. Continuous improvement, or viewed slightly differently, continuous learning can be achieved by systematically and in an organized way working through the PDCA loop.
PDCA is an acronym for the set cycle in which the activities are organized and performed.

The cycle starts with the formulation of a **Plan**, which can be viewed as the most important element of the cycle. If the plans are ineffective, all subsequent actions will be ineffective.

Kume ((Kume, 1995) states that improvement consists of bridging the gap between the ideal situation and the actual situation. For this improvement to be effective and therefore for real learning to take place, an accurate perception and a good understanding of both the ideal situation as well as the actual situation is required.

The next step in the process is the **Doing**. This is the implementation of the plan, but it is not just a mere execution of the plan. It includes ensuring that the people who are responsible for carrying out the plan understand why they have to do it and that the plan is communicated adequately to all the roll players. The necessary resources must be available and trained sufficiently to enable them to implement the plan the way it was intended to be implemented.

The third step is the **Checking** activity. This should be done on the following two aspects and should be evaluated separately (Kume, 1995):-

- Was the plan followed and implemented the way it was intended?

- Was the plan itself adequate to address the issues?

Non-achievement or under achievement is usually as a result of one of the two aspects, or a combination of both, not being achieved. It is very important to establish exactly which aspect caused the failure to achieve, since the corrective action must be specifically focused on that aspect. Corrective action required for not following the plan would be very different to corrective action if the plan was inadequate.

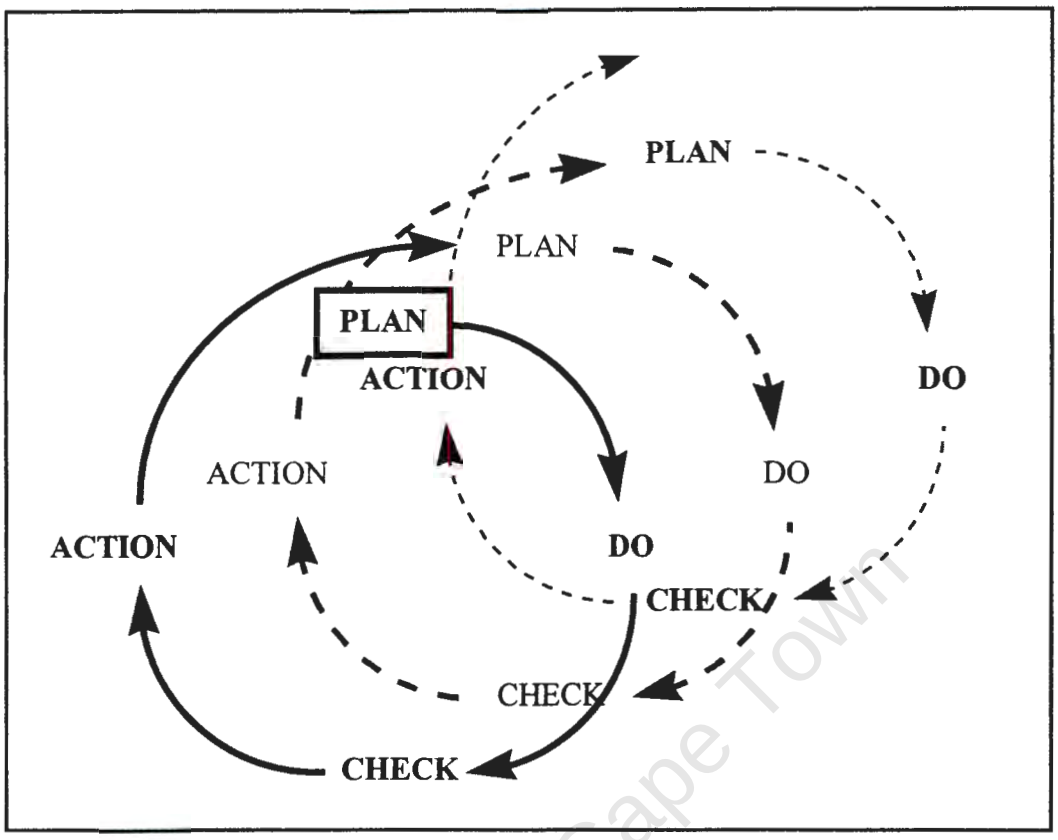
Referring back to the Hoshin Kanri method discussed earlier in this chapter, if the plan is inadequate the *activities and control items* may have to be revised. If the plan is not adhered to then new *measures* will have to be introduced to develop *activities and control items* to ensure that people do adhere to the plan.

The fourth and final step of the first loop is Action. Kume (Kume, 1995) points out that it is essential when corrective action is taken, to establish whether the action will address the real cause of the problem or whether it would just remove the symptoms that manifest as a result of the real problem occurring. If only the symptoms are addressed, the problem will emerge again at a later stage, possibly in a different situation displaying different symptoms, but having the same root cause. The first step in improvement is to interpret and understand the results achieved by the actions. However, in order to get to the ideal situation, it is required to understand the processes that lead to the result. Even if the expected result is achieved, there may still be room for improvement to get to the result in a more efficient or effective way.

At the end of the first loop, it is not unusual that another loop will follow, whereby the plans are revised and the sequential steps are followed. This process can be repeated indefinitely and will ultimately, as discussed in the previous chapter with the Scientific Method, get closer and closer to the ideal solution.

The PDCA cycle is a learning cycle and is widely used in Japanese Industry. It can be graphically represented as in Figure 17.

Figure 17 The PDCA Cycle



It is not actually one closed loop but a continuing spiral of improvements. The solid loop is the first loop and its fourth step or action results in a plan being developed as the first step of the second loop, indicated by the bold broken line. The action taken in this loop results in a plan being developed, which starts off the third loop, indicated by the fainter broken line, etc.

This technique by its explanation demonstrates the process of continuous improvement within a pragmatic philosophy.

SOFT SYSTEMS METHODOLOGY

The Soft Systems Methodology (SSM) was developed by Peter Checkland (Rosenhead, 1989). It was evolved from the need to solve ill defined problems which emerge when multiple perspectives and obscured objectives are at the order of the day.

The methodology focuses on the learning that can be achieved from understanding the purposeful activities that take place in the process, rather than to attempt to analyze the elements in the system. This ties in with Ackoff's (Ackoff, 1974) systems thinking in terms of synthesizing rather than analyzing if a better understanding of the functioning of the total systems is investigated.

The emphasis therefore moves away from a system that will achieve objectives, to a learning process. This learning process and the ensuing debate will then culminate into changes that will both be systematically desirable and culturally feasible.

SSM therefore articulates a process of inquiry which leads to some action. This action may however not be an end point unless the users elect it to be one. It can therefore be one step in the total process of developing and learning more about the process. This supports the pragmatic approach which was adopted as the basic philosophical framework for this dissertation.

The underlying assumptions made are as follows (Rosenhead, 1989):-

1. Managing is interpreted as a process of achieving organized action. The manager functions in a dynamic, ever changing and hurried world which consists of a maze of interacting events and ideas. He draws from perceptions of this world and evaluate these within his own objectives and motives. He expresses his own ideas of this world and the events which are taking place. These events and perceptions can also lead to a process of inquiry which can ultimately result in him taking some action to intervene or to refrain from intervening.
2. Different individuals and groups will make different evaluations which may lead to different actions. This would be steered by their specific views or Weltanschauung as discussed earlier in this dissertation.

3. Systems ideas will be helpful to consciously articulate the process described in point 1. The idea of a system being a containing whole that has certain properties, which only has meaning while it is relevant to the system and not to its individual elements.

4. A set of activities linked together in a logical structure to constitute a purposeful whole, could be taken to be a new concept of system to set alongside the well known "Natural" and "Designed" systems. The name adopted for this new concept was "Human Activity System."

   It is accepted that there will be many different possibilities of describing any named real world purposeful action and that this description will have to be explicit about the view or Weltanschauung that was taken as a given, if it is to be used analytically. This view will influence the interpretation applied by the interpreter.

5. SSM learns by comparing pure models of purposeful activity with perceptions and interpretations of what is going on in the real world.

6. SSM is an articulation of a complex social process in which the underlying assumptions about the relevant "Real world " are debated, challenged and tested and is therefore intrinsically a participative process.

THE MECHANICS OF THE LEARNING CYCLE OF SSM.

The learning process can be sub-divided into seven basic stages, which in turn can be grouped as follows:

Stage 1 Assemble the interacting "mess" of problem issues by recording elements of slow-to-change structure and the dynamic elements of the continuously-changing process.

Stage 2 Forming a view of the inter-relationships in creating a rich picture of the situation.

Stage 3 Formulating the Root Definitions. This can be done by considering the elements of CATWOE as shown in Figure 18 (Rosenhead, 1989).

Figure 18 CATWOE Elements

C	CUSTOMERS	Who would be the victims/beneficiaries of the purposeful activity ?
A	ACTORS	Who would do the activities ?
T	TRANSFORMATION PROCESS	What is the purposeful activity expressed as a process ? 
W	WELTANSCHAUUNG	What view of the world makes this definition meaningful ?
O	OWNER	Who could stop the activity ?
E	ENVIRONMENTAL CONSTRAINTS	What constraints in its environment does this system take as given ?

Stage 4 Building conceptual models.

This can be achieved by describing the key activities (7±2) that has to be present to support the Root Definitions and to structure them according to logical dependencies. To ensure that the system will not fail it should be tested in terms of :

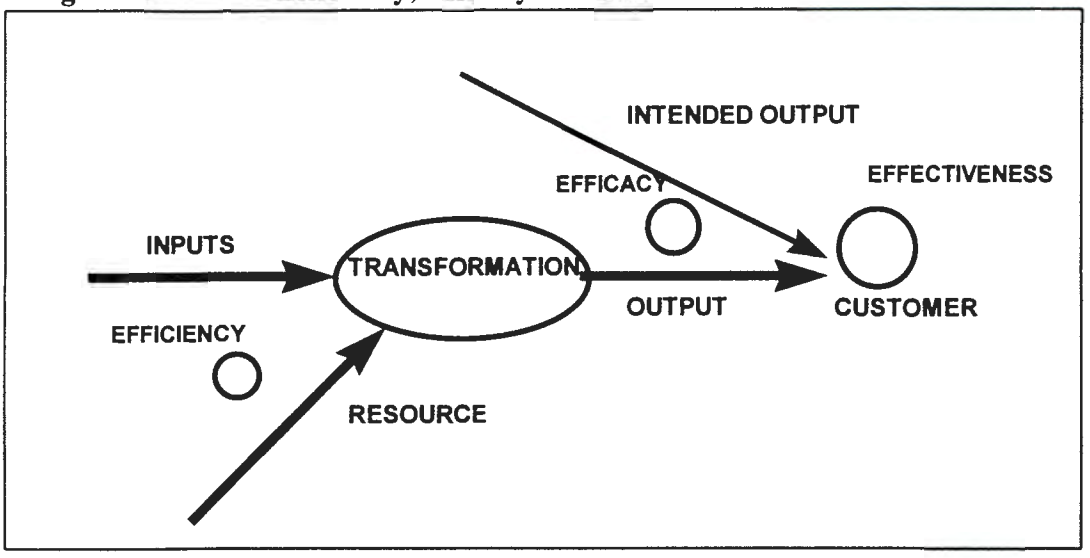
- Effectiveness - Are the right things being done ?
  This is a tactical measurement of the extent to which we satisfy the customers' needs and requirements.

- Efficacy - Do we achieve what we intend to achieve ?
  This is a technical measurement whether we achieve what we intend or plan to achieve.

- Efficiency - How well do we achieve ?
  This is a strategic measurement of how productive the available resources are applied. Are we making optimum use of our resources.

Figure 19 illustrates the differences between these three principles.

Figure 19 Efficiency, Efficacy and Effectiveness



Stage 5 Comparing the models with what we perceive to be reality.

This can be achieved by simply recording the differences between the model and the perceptions and happenings in the actual situation.

A series of specific questions can be developed concerning activities and links between activities if the concern is more detailed.

Another approach would be to operate the system on paper, with the aid of some form of simulation.

A fourth technique would be to model the relevant parts of reality and then overlay it onto the conceptual model to highlight the differences.

Stage 6 Defining changes.

The differences between the model and reality should be overcome by discussing possible changes which could narrow the gap.

The result will be a list of all possible changes. Some of these changes may be conflicting in nature. In order to resolve these conflicts it is a sound practice to examine the underlying assumptions and select the changes with the assumptions that are the least demanding.

Ideas for changes need to be systemically desirable as well as culturally feasible to promote sustained acceptance.

Stage 7 Taking action.

When some changes have been identified as being both systemically desirable and culturally feasible they can be grouped together to select action to be implemented. The cycle of the SSM can be completed by implementing these changes.

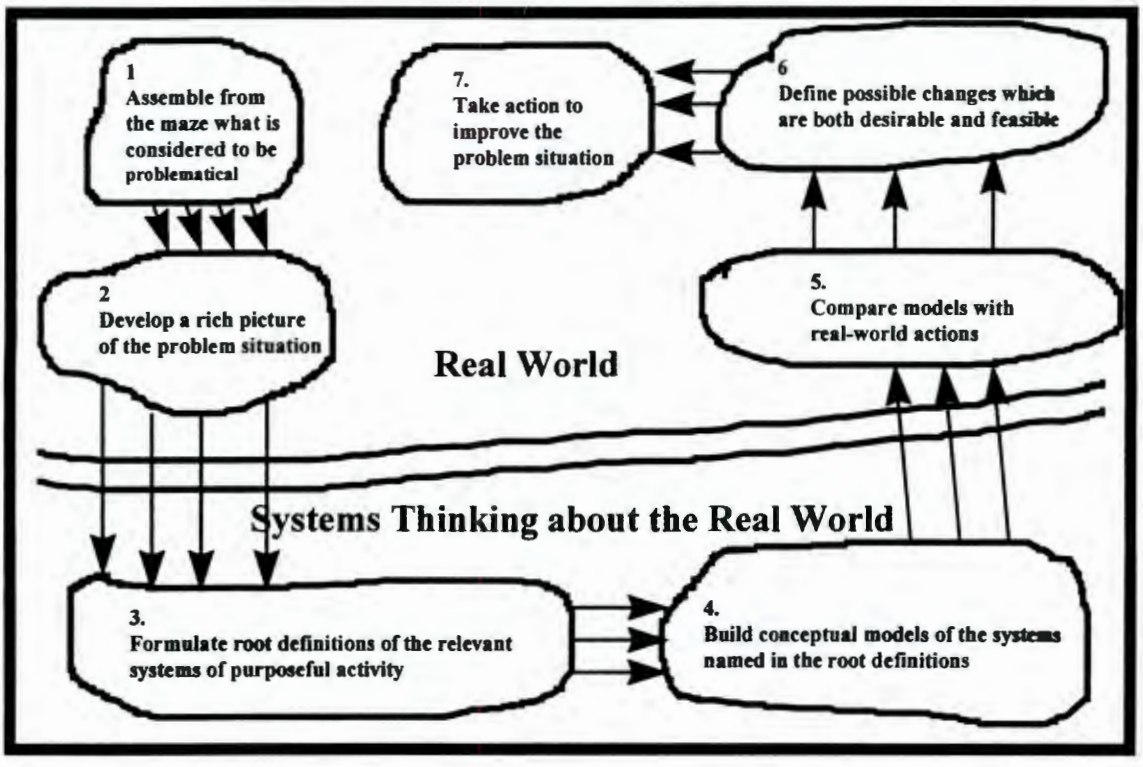
This in itself may then result in a re-cycle of the whole process, which supports the basic philosophy that there is no permanent solution for any problem.

It is therefore clear that SSM is a dynamic learning process which can be ended arbitrarily. This does not imply that the flux of events and ideas end, since they will move on in a never ending way.

The learning cycle of the SSM can be used as a practical framework to formulate an introduction plan when planning the implementation of new systems or work methods in an organization. Its principles are complimentary to the Scientific Method as an operational tool.

The process is summarized in Figure 20.

Figure 20 **The Learning Cycle of SSM** (Rosenhead, 1989)



VIABLE SYSTEMS MODEL

VIABILITY

An organization's viability can be defined as its ability to adapt to changes in its environment or maintaining its identity in a changing environment.

Viability is a function of the balance achieved between the autonomy of the relevant sub-systems and the integration of the system as a whole. The viable organization must function well as a total system, while it relies on individual divisions or sub-systems, to perform its function effectively in terms of its relation with the company as a whole (the total system).

The changes in the environment add to the variety to which the management of the organization is exposed.

The concept of variety can be described as a measure of the possible number of states the system can be in and a measure of the complexity of the state in which the system is. Variety in the management context can be seen as the number of ways management can respond to a specific situation.

When management's variety is equal or more than the variety of the system, **Requisite Variety** is achieved. Requisite Variety should happen by design to ensure that it is favorable for the organization and can be achieved through combination of attenuation and amplification.

It can therefore be seen that the successful management of change is crucial for the survival of the company.

THE VIABLE SYSTEMS MODEL (VSM)

The VSM developed by Stafford Beer (Espejo, 1989) is a thorough working out of ideas from the science of organization or cybernetics, focusing on the organization rather than structure.
The VSM is an arrangement of five functional elements that are interacting through a complexity of information and control loops.

The five functional elements can be briefly described as:

System 1 (S1)

This can be described as the core system of the organization, which is viable in its own right. The organization as a total system would not be viable without this system. It can be seen as the core business of the organization - if it was not for this system, the organization would not have any right to exist. This system is directly involved in the implementation of whatever the organization's output is.

Each part connects to its local environment and therefore absorbs much of the overall environmental variety. The success or failure of the organization, as perceived by the environment in which it operates, depends to a large degree on the success or failure of System 1.

System 2 (S2)

This system co-ordinates the parts that make up S1 in a harmonious way. The justification of its existence lies in the fact that it supports S1 in dampening uncontrolled oscillations between the parts that make up S1.

System 3 (S3)

System 3 is a control function that is ultimately responsible for maintaining internal stability of the internal environment in which S1 must function.
It interprets policy decisions for S1 and ensures the effective implementation of these policies by allocating the resources to the S1's to support these policies.

S1 carries out audits using its auditing channel to manage and control the efficiency and efficacy of the core process.

System 4 (S4)

System 4 has the responsibility for the intelligence function to gather information and the reporting function on external as well as internal information. This information is communicated upwards and downwards as and when it is required.
S4 also has the responsibility to transmit urgent information rapidly from the other systems to S5.
It provides a model of the total environment in which the organization functions.
S4 also determines the effectiveness of the core process in its environment - the extent in which the output of the organization meets the needs of its customers.

System 5

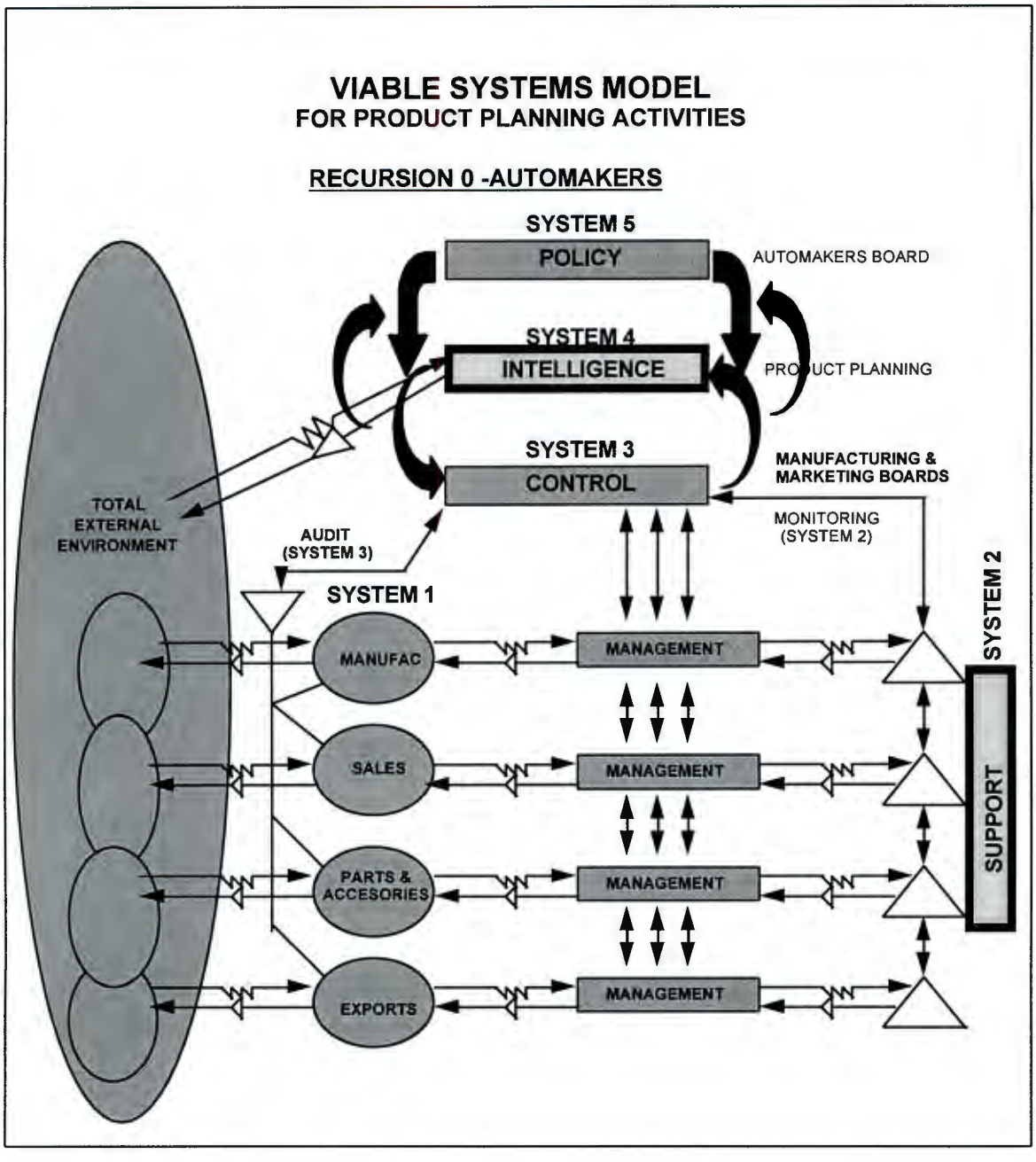
System 5 is responsible for policy making and setting direction for the organization.
It must also respond to significant signals from the other systems and needs to arbitrate, when internal demands identified by S3 and external demands as identified by S4 are in conflict.
S5 represents the essential qualities of the whole system to the containing environment in which the organization functions. S5 deals with the perceptions the external world holds about the organization.

It can therefore be seen that S1 performs the basic core transformation processes of the organization and must be supported by S2, S3, S4 and S5 to ensure the sustained viability of the organization.

The VSM is a very explicit tool to clarify the role of specific functions in an organization and will be used in the implementation plan, which will be developed towards the end of this dissertation.

A schematic representation of a VSM for Automakers with regards to the role of Product Planning is shown in Figure 21 and will be discussed in detail in Chapter 9.

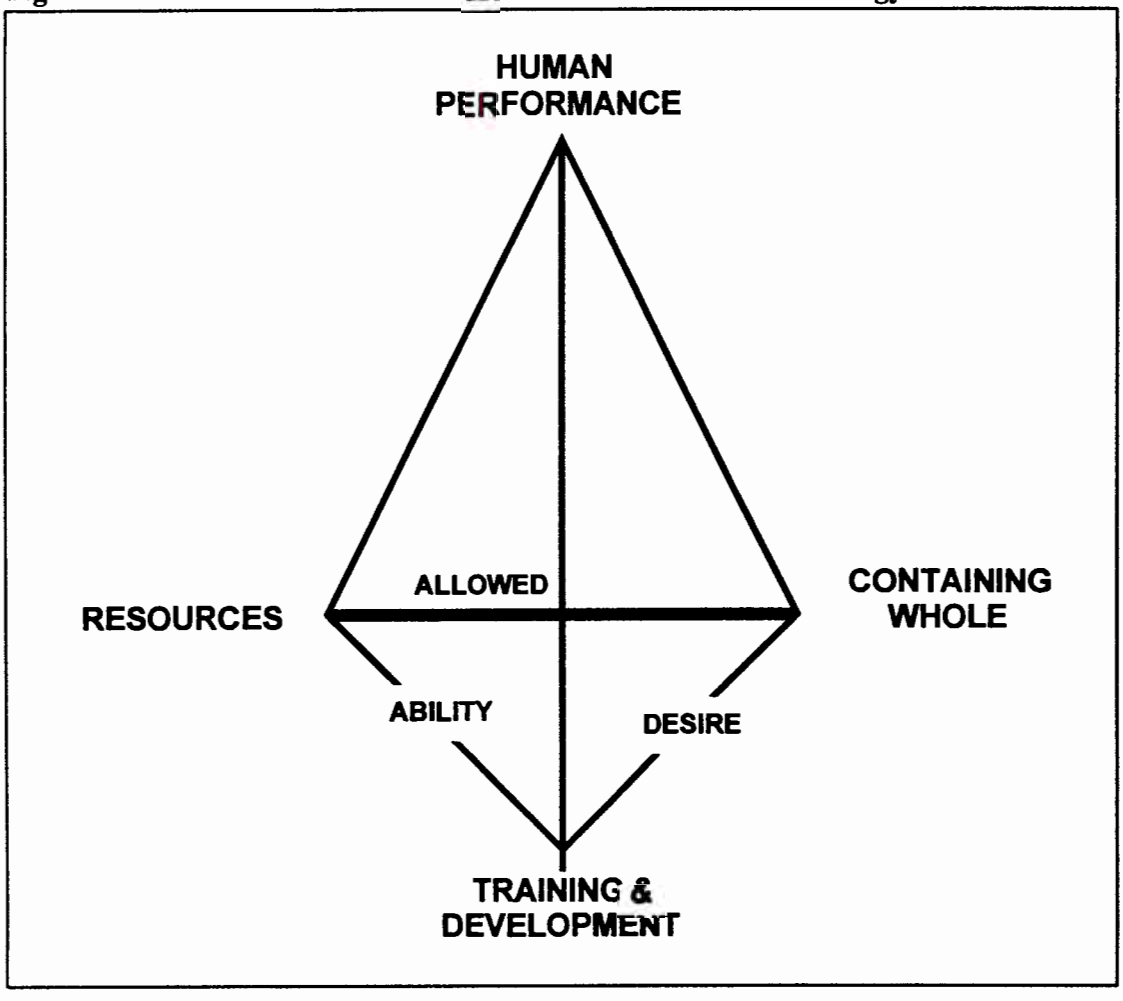
Figure 21 **Viable Systems Model of Automakers Showing the Role of Product Planning in the organization.**



HUMAN PERFORMANCE TECHNOLOGY

An illustrative model of HPT is shown in Figure 22 (Lecture Notes, 1995)

Figure 22 The Tetrahedron of Human Performance Technology



To realize the expected performance from humans all 3 points on the above tetra-hedron need to be addressed.

If Statistical Process Analysis (SPC) is used as a simplified example, the following criteria can be seen:

1. If people are fully trained and charts (Resources) are available, a person has the ability to perform.

2. If people are fully trained and a perceived management support (Containing Whole) is in place, a person will have the desire to perform.

3. If charts (Resources) are available and management support (containing whole) is in place the person is enabled to perform.

All these elements must be in place to co-produce the required output. If all these elements are in place and the person still does not perform then more drastic intervention should be considered.

WORK SYSTEMS

Luc Hoebeke (Hoebeke, 1994) described a conceptual framework that can be used to understand the task-related issues of work systems and the possible intervention in these systems to improve or redirect the processes.

The work system form the basic unit of the conceptual framework. A work system is defined as a purposeful definition of the real world, in which people spend effort in more or less coherent activities for mutually influencing each other and their environment.

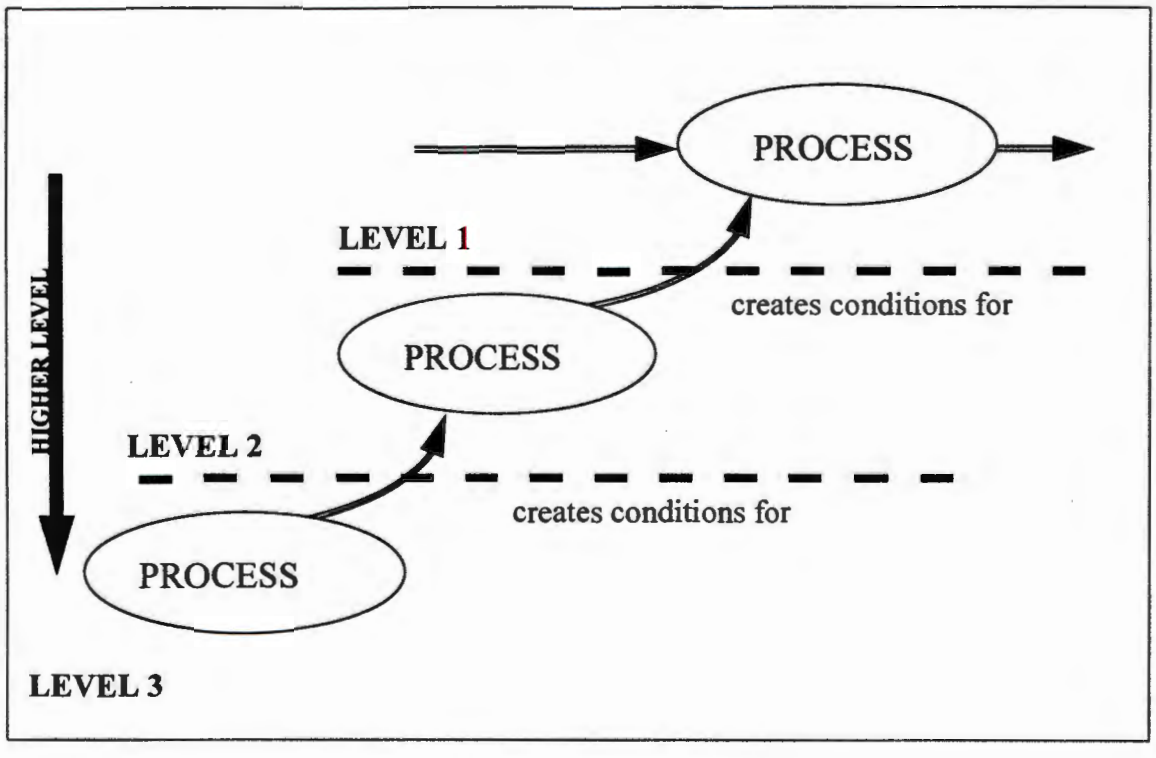
Centrally to the work system there is a transformation process that expresses a basic purpose behind the work system and transforms a specified input into a specified output by utilizing available resources. The output must contain the input which has been transformed during the process. The latter then clearly distinguishing the input from the resources required for the transformation. Sometimes people, when using a systems approach, erroneously confuse inputs and resources. The input is the actual matter which

is transformed into the output. Resources are utilized to make this transformation process possible, but is not physically transformed in any way - they are basically in the same state after the completion of the transformation process as they were before it started.

To make the process more meaningful and to differentiate the hierarchical nature of processes Hoebeke (Hoebeke, 1994) added a new concept, which he calls process levels. The output of a process of a higher order, creates conditions for one of a lower order to take place.

Figure 23 shows a graphical representation of the process levels.

Figure 23 Process Levels



To avoid confusion with the organizational hierarchy, Hoebeke calls this process hierarchy process levels. Where the organizational hierarchy is linked to the relations between people in the organization and to their prerogatives and benefits, process levels refer to the contributions they make to the process.

Most people normally contribute to processes on three successive process levels.

Contributions are those activities of people belonging to the work system, which are seen to be helping to realize the defined output of the process. These contributions can be viewed as resources employed to assist with the transformation process.

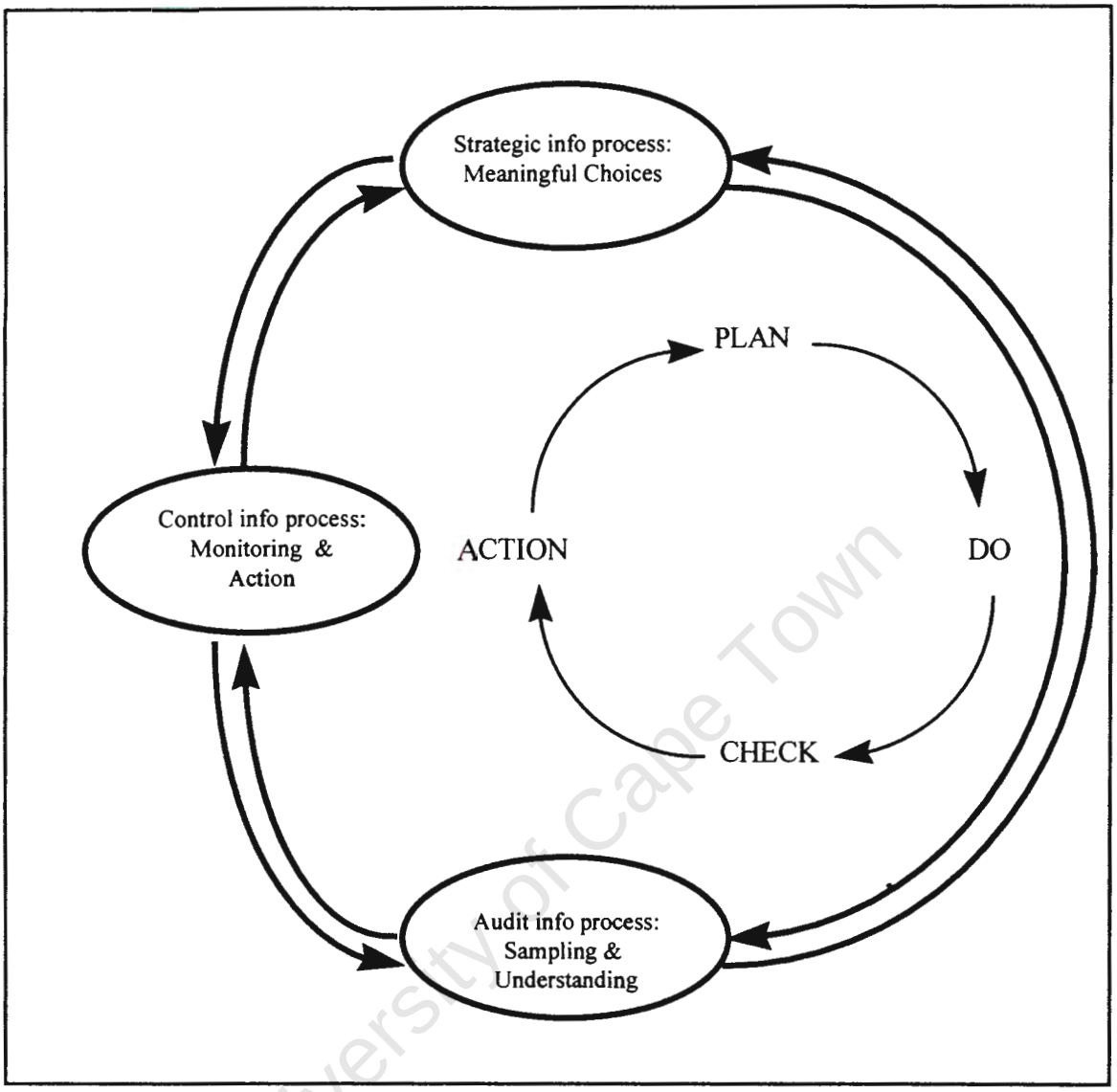
A person can be held responsible only for his own individual contributions. Responsibility can never be delegated. This issue is very important and is probably the most abused and misused concept in the control aspects of management. It is therefore useful to hold someone accountable for the output of the process. He will be the person to be contacted by the external parties influenced by the results of the process.
The person accountable for the process and its results is the one who assesses the various contributions needed from the people involved in the process, in other words he **assigns** responsibilities. This means that the relevant active role players are told whet their responsibilities are - what contributions they are expected to make towards the transformation process.

There are commonly three major roles in any transformation process:

- Actors - Those who contribute to the realization of the output.
- Clients - Those who are affected by the process - beneficiaries or victims.
- Owners - Those who can effectively decide to stop the process.

Care must be taken where these three roles are taken up by the same people, as this can result in closed system behavior. The role players can get into a mode where they are under the impression that the system operates in a vacuum and is viable in its own right, without taking cognizance of the containing environment in which it functions. With reference to the VSM, which was discussed earlier in this chapter, this closed system behavior can occur when S2, S3 or S4 function start to lose track of their real obligation to S1. A good example in today's organizations is how Information Systems departments view themselves. This is normally as a result of specialist knowledge, which is transformed into a power base and the actual purpose of the function is blanked out by their specialist knowledge and self esteem.

Figure 24 The Three Fundamental Information Processes.



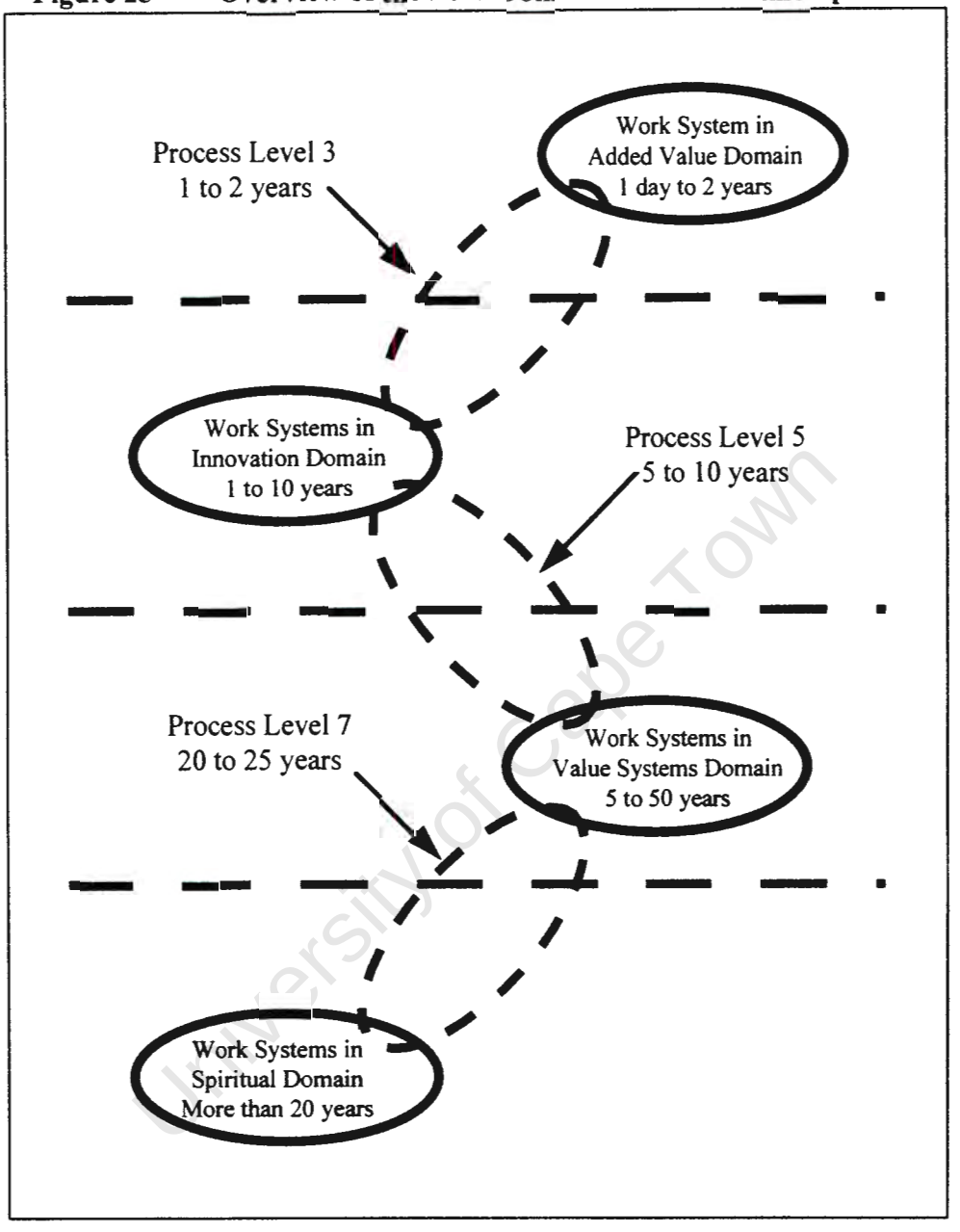
Hoebeke also uses the theories developed by Elliott Jaques to utilize time span; the time needed to materialize the results of the activities deployed, to determine the process levels. The longer the time span, the higher the process level. This results in the grouping of process levels into 4 domains based on their respective time spans. Process levels 3, 5 and 7 being the transitional levels.

These are:

- Added Value Domain
- Innovation Domain
- Value Systems Domain
- Spiritual Domain

Figure 25 demonstrates the span of the four domains pictorially.

Figure 25 Overview of the Four Domains and their Time Spans.



Work systems will also be used during the development and explanation of the implementation plan in Chapter 9, because it provides a logical and graphical way to understand how specific functions fit into the overall organization.

CHAPTER 7

This chapter briefly describes some of the techniques that were used to develop explanations and proposed solutions for the complication as stated in Chapter 3.
These techniques mainly cover practical ways of structuring and analyzing data. Some of these techniques include Affinity Diagrams, Inter-Relations Digraphs and Process Decision Program Charts.

TECHNIQUES USED IN THIS DISSERTATION

AFFINITY DIAGRAMS

The Affinity Diagram Method was developed from the KJ Method developed by Dr. Kawakita Jiro (Asaka, 1990).
It uses the affinity between partial, piecemeal items of verbal data to help understand the structure of the overall problem systematically. It therefore assists the user to understand the problem that needs to be resolved better.

It uses words that express facts, predictions, ideas, opinions and similar expressions about "soft" or "fuzzy" situations or situations that have not been experienced before.
It provides a framework based on similarities, common elements and relationships expressed in the user's statements or in the background and underlying assumptions of the statements.

The Affinity Diagram Method organizes data into an easily understandable diagram that is indicative or descriptive of the overall or macro nature of the study object.
It must be seen as a creative process that can facilitate breaking through preconceived notions about a situation.
Affinity Diagrams help people think more effectively about problems in the following 3 ways:

- It helps the people to define the nature of the problem and thereby bringing out the hidden problems.

- It helps to organize and order "fuzzy" ideas.

- It clearly indicates the proper direction to take in solving problems.

The spin-off benefit of the process is that group members tend to better understand and inter-act with each other. This then results in better teamwork and enthusiasm to carry out the group's mission.

The steps in making an Affinity Diagram can be summarized as follows:

1. Deciding on a theme.

2. Collecting verbal data. This can be achieved through brainstorming, observation, research and individual thought or interviews.

3. Making data cards by writing each item of verbal data collected on a single data card.

4. Arranging the cards by identifying the cards that are alike in a way and grouping them together.

5. Making the affinity cards by making a short but complete statement summarizing the characteristics of the group of cards on 1 card. This card is called an affinity card.

6. Stacking affinity cards and data cards by stacking the grouped data cards on top of each other and putting their affinity card on top.

7. Continuing the card arrangement by repeating steps 4 through to 6 until you have 5 or fewer packs.

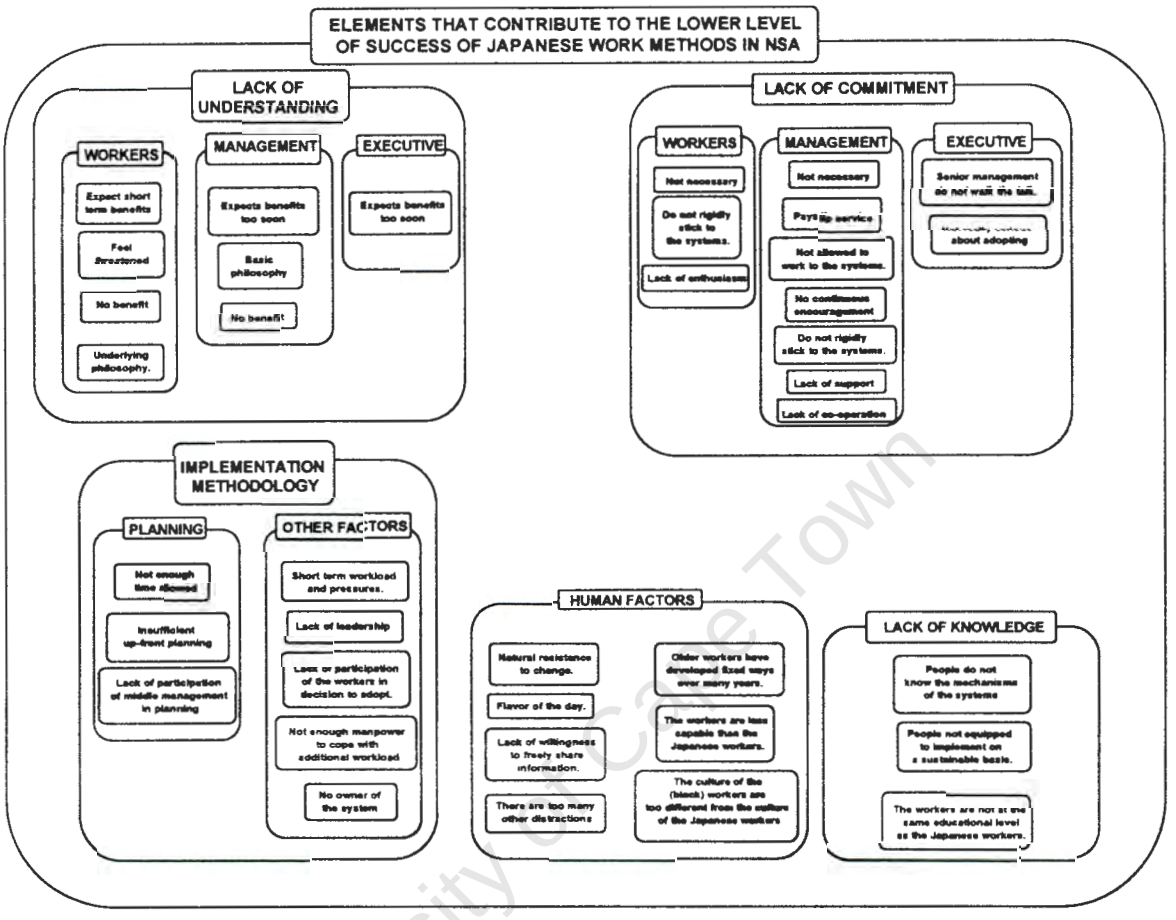
8. Distributing the cards on a large board but keeping them in their relevant groups to create a grouped picture of the total situation.

9. Making an affinity diagram by drawing physical borders around the groups and sub-groups.

Affinity Diagrams are useful when you are working with themes that you do not understand or that are not clearly defined. It is also useful where traditional methods failed to result in the reaching of a conclusion.

Figure 26 illustrates the affinity diagram of a theme which was used to develop the explanatory hypothesis for this dissertation and which is discussed in detail in the next chapter.

Figure 26 **An Affinity Diagram of a Theme "Elements that Contribute to the Lower Level of Success of Japanese Systems in NSA."**



INTER-RELATIONS DIGRAPHS

The Inter-Relations Digraph method is used to analyze problems where the causes of the problem have complex interrelationships (Asaka,1990). Making a diagram that shows the cause-and-effect relationships and the relationships between the different causal factors enables you to identify the real causes of the problem and also facilitates the discovery of methods to resolve the problems. The diagram can also be used to identify the elements required to achieve a specific goal.

The process in making a Inter-Relations Digraph concerning a specific problem has the following advantages over some other methodologies:

1. The cause-and-effect diagram shows the various factors and the causal relationships between them without being limited to a specific format.

2. Inter-Relations Digraphs use data cards as well as arrows to indicate a series of cause-and-effect relationships.

3. They are helpful to discover the principal causes that affect the entire situation by showing all causal relationships in a broad perspective.

The steps to be followed in making the Inter-Relations Digraph are:

1. Describing the problem by writing a very simple and specific description of the problem relating to the chosen theme.

2. Making cause cards by writing down simply and clearly the perceived causes affecting the problem. Write each cause on a single card.

3. Distributing the cards by grouping similar cards together.

4. Arranging the cards according to how strong their cause-and-effect relationships are with the problem. Grouping the cards with the strongest relationship the closest to the problem card. This would then divide the cards into 1st, 2nd, 3rd and 4th level causes. Arrows are then drawn from the causes towards the effects.

5. Adding and revising cards by changing the notes on the cards and move the cards around to ensure that the arrows do not cross.
6. Determining the relationship among all the cards by studying the card grouping as a whole to ensure a good understanding of the relationships between groups of cards to assist in understanding the cause-and-effect relationships.

7. Making the Inter-Relations Digraph by pasting the cards in place.

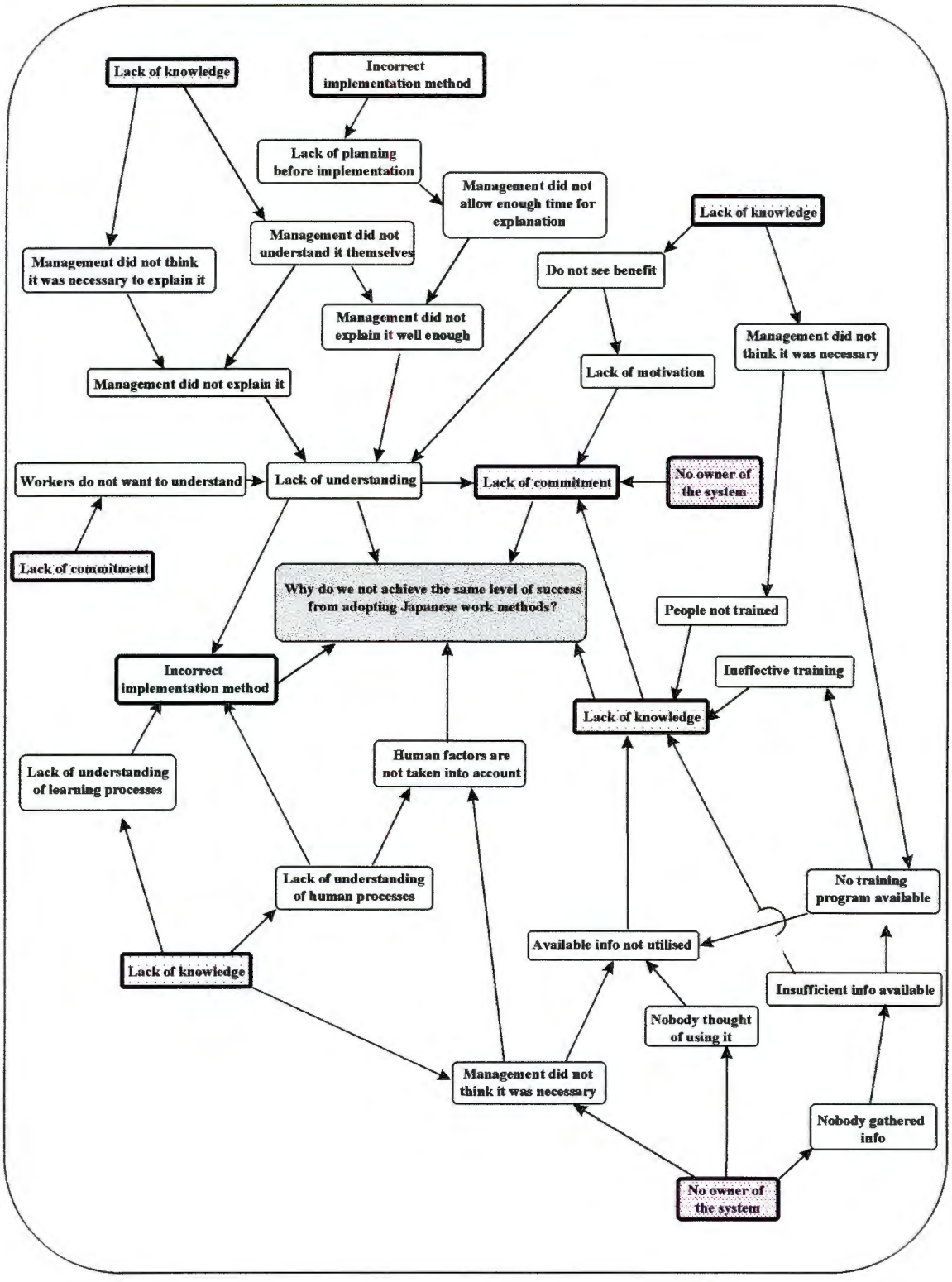
8. Identifying the principle causes by isolating the causes that have particularly important causal relationships with the problem. Identify these cards by highlighting them with a colored box and coloring the associated arrows with a thick colored line.

Although cause-and-effect diagrams are used widely to clarify which causes are most responsible for a specific problem, the Inter-Relations Digraph can enhance and facilitate discussion where there are complex relationships between many causes and effects. Sometimes it is necessary to take a fresh look at a problem from a different angle by redefining the problem statement or sub-dividing the problem into 2 or 3 parts.

It can also be useful to examine the second, third or fourth layers of the problem to discover the underlying root causes of the problem.

Figure 27 illustrates the Inter-Relations Digraph of a theme "Adopting Japanese Systems and Work Methods in NSA", which will be used in refining the explanatory hypothesis in Chapter 8.

Figure 27 Inter-Relations Digraph of a Theme "Adopting Japanese Systems and Work Methods in NSA ".



PROCESS DECISION PROGRAM CHART (PDPC)

The PDPC (Lecture Notes, 1996) is a method which maps out conceivable events and contingencies that can occur in any implementation plan. It in turn identifies feasible countermeasures in response to these problems. This tool is used to plan each possible chain of events that needs to occur when the problem or goal is an unfamiliar one.

The PDPC anticipates the unexpected and develop countermeasures that will either prevent the deviation from occurring or be in place in case the deviation occurs.

The PDPC should only be used when the task at hand is either new or unique and the stakes of potential failure are high. The only limitations to the PDPC are the available time, knowledge and imagination of the user group.

There are two basic types of PDPC's :-

- Pre-Planned PDPC
- Real Time PDPC.

The difference between Pre-Planned PDPC and Real Time PDPC is illustrated in Figure 28.

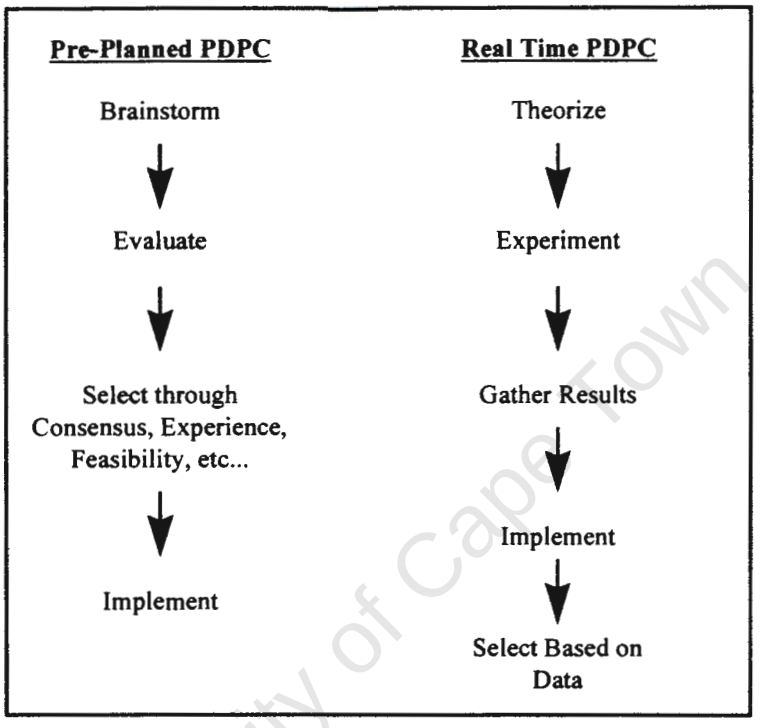
The steps to develop a PDPC are as follows:

1. Assemble the right team consisting of two basic components
   - Managers/employees with an overview of the entire process flow.
   - Managers/employees who are experts in each step in the process.
2. Determine the basic flow of proposed activities at a fairly broad level.

3. Choose the most workable chart format - Graphical or Outline.

4. Construct the PDPC using the chosen format.

Figure 28 The Difference Between a Pre-Planned and a Real Time PDPC



The biggest advantage of PDPC is that it makes breakthrough possible by looking for simple answers to simple questions. This is mainly achieved by repetitively asking "What if?" questions.

CHAPTER 8

This chapter starts the practical application of the framework that was described in the previous chapters. The writer goes through the physical processes of gathering data and developing, analyzing and refining the explanatory hypotheses through a process of abductive reasoning.

THE DEVELOPMENT OF THE EXPLANATORY HYPOTHESIS.

GATHERING INFORMATION

Thirty interviews were conducted with various people in the organization.
This included some of the Executive Management, a Japanese manager in the liaison office in South Africa, a Japanese manager based in Japan who is involved with various overseas operations, people who were involved in the implementation of Japanese work methods and systems in the past, some New Model Project Managers, middle management and some people at the operating level.
I tried to cover the total spectrum of people involved in the implementation of these systems. This was to ensure that all possible perspectives are incorporated in the results. I refer to the section on Multiple Perspectives in Chapter 4.

The interviews were deliberately done in an inconspicuous way during normal conversation, in an effort to get honest answers. This was done to ensure that the person being interviewed does not give an answer which ties in with what he had been taught in some course or which came out of a seminar he attended. I required an answer which reflected what actually happened in practice when these systems or work methods were implemented. I refer the reader to Systems-in-use versus Espoused systems in Chapter 6.

Initially the question was:-

"Why do you think the adoption of Japanese systems fail in this company?"

This resulted in people with vested interests, becoming defensive and not honest in their replies. The question was then reformulated to avoid this difficulty.

The question was reformulated as follows:-

> ***"Why do you think we do not achieve the same level of success when we adopt Japanese work methods and systems in this company?"***

The question was deliberately formulated to imply that we **do not** achieve the same level of success than the Japanese do in Japan, to avoid the debate whether the systems are successfully implemented or not.

A SUMMARY OF THE CAUSES THAT WERE IDENTIFIED DURING THE INTERVIEWS.

1. Some workers do not see why the systems should be introduced. They feel that they have done well up to now, so why upset the status quo with new systems and work methods.

2. Some members of the middle management do not see why the systems should be introduced. In some cases they feel that it reflects badly on their ability to manage their people.

3. People at all levels do not understand the mechanisms of how the systems work. This was apparent when they were asked to reflect upon some of the work methods and systems that were introduced in the past.

4. People's natural resistance to change also played a huge roll in their response to the introduction of these methods. They built up their "comfort zones" over many years and do not like it to be disturbed by these "foreign" systems.

5. People feel threatened by the systems. It makes them feel insecure because they do not know what the impact of the introduction of these systems will have on their own positions in the company. In some cases it also draws some focus and attention to specific areas, who may not necessarily be used to being the focus of attention.

6. People do not see the benefit of adopting the systems.

7. Workers expect short term benefits while the system objectives are generally aimed at long term improvement. They want to see an immediate improvement or else they feel that it is just a waste of time and effort.

8. Management expects benefits too soon and gets disillusioned when this does not materialize.

9. Management does not understand the basic philosophy of the system and this sometimes results in false or inappropriate expectations.

10. The workers do not understand the underlying philosophy behind these work methods and systems.

11. Management pays lip service to adopting the systems and the moment they are required to put in some effort in adopting these systems, their support is not always forthcoming.

12. People responsible for the implementation of the systems do not understand the underlying philosophy and they try to apply a recipe given to them by the Japanese.

13. Sometimes the people tasked with the responsibility of implementing the systems, do not understand the mechanism of the system.

14. People feel they do not have enough time to implement the systems due to short term workload and pressures.

15. People are not consistently and continuously allowed to work according to the systems.

    The moment something goes wrong in the process or some problems are highlighted by the introduction of the systems, they are forced to bypass the system or revert back to the "old way" of doing things.

16. Middle management and the workers are not given the required tools to implement the systems on a sustainable basis.

17. The current culture in the organization of insufficient up-front planning also manifests itself in the introduction of these systems. In most cases people rush in and get "it done" and then try to fix the resulting problems later.

18. There is a lack of discipline to rigidly apply the systems even in adverse conditions or when difficulty is experienced.

19. In some cases there is a lack of support from executive or management for the people during the implementation phase or even after the initial stages of the implementation of the systems or work methods.

20. Top management does not continuously encourage people to work according to the systems and to adopt it as part of their day to day routine.

21. The culture of the focus on the " flavor of the day" sometimes prevail. Everybody is very enthusiastic at the outset of the introduction of the system, but they appear to get bored with it and then re-focus on something new and more exciting.

22. People's lack of willingness to freely share information. The possession of specific knowledge or know-how is sometimes used as a tool to entrench the person's own position. He is not willing to freely share this know-how with other people since this may erode his own power base.

23. Older workers have their fixed ways developed over many years and find it difficult to adopt new work methods. This becomes very obvious where radical or fundamental change is required.

24. Sometimes there is a lack of leadership during the implementation phase.

25. In some cases middle management does not give their full co-operation and the people tasked with the implementation of the new systems or work methods find it extremely difficult to get the initiatives off the ground.

26. In most cases there is a lack of sustained enthusiasm by the workers for adopting the new systems successfully.

27. There is not enough participation by the workers in the decision making process when decisions are made to adopt new systems or work methods. The people that are directly affected by these systems are not part of it from the outset.

28. Middle management is not part of the planning process for the implementation of the new systems. They only get drawn into the process when it is too late for them to have any significance in influencing the basic direction and methodology that will be used to adopt the new systems.

29. Senior management does not walk the talk. They do not appear to actively promote and support the implementation of the new systems.

30. The workers are not at the same educational level as the Japanese workers. There is a high degree of illiteracy amongst the workers and the general level of academic training is relatively low compared to that of the Japanese workers.

31. The culture of the (Black) South African workers is too different from the culture of the Japanese workers. This manifests itself in their perceived attitude to their work and the well-being of the company in general.

32. The workers are less capable than the Japanese workers.

33. There are too many other distractions in the work environment i.e. industrial action.

34. Top management is perceived not to be really serious about adopting the systems.

35. There is no perceived **direct** benefit to the worker if he adheres to the systems and work methods.

36. There is not enough manpower to cope with the additional workload as a result of adopting the systems.

37. There is no single owner or dedicated accountable person for the introduction of the new system or work method.

The above causes identified during the interviews may only be symptomatic of the root cause to the problem. The dilemma is now to make sense out of this maze of symptoms and possible causes and to identify the root cause or group of problems that can be addressed, to resolve the problem or improve the situation.

This inquiry would be simplified if these causes can be rationalized into smaller groups of causes, which have some commonality and which can therefore be grouped in a logical way.

A small group of people involved in the implementation of the Japanese methods and systems was tasked to come up with some logical grouping of these causes.

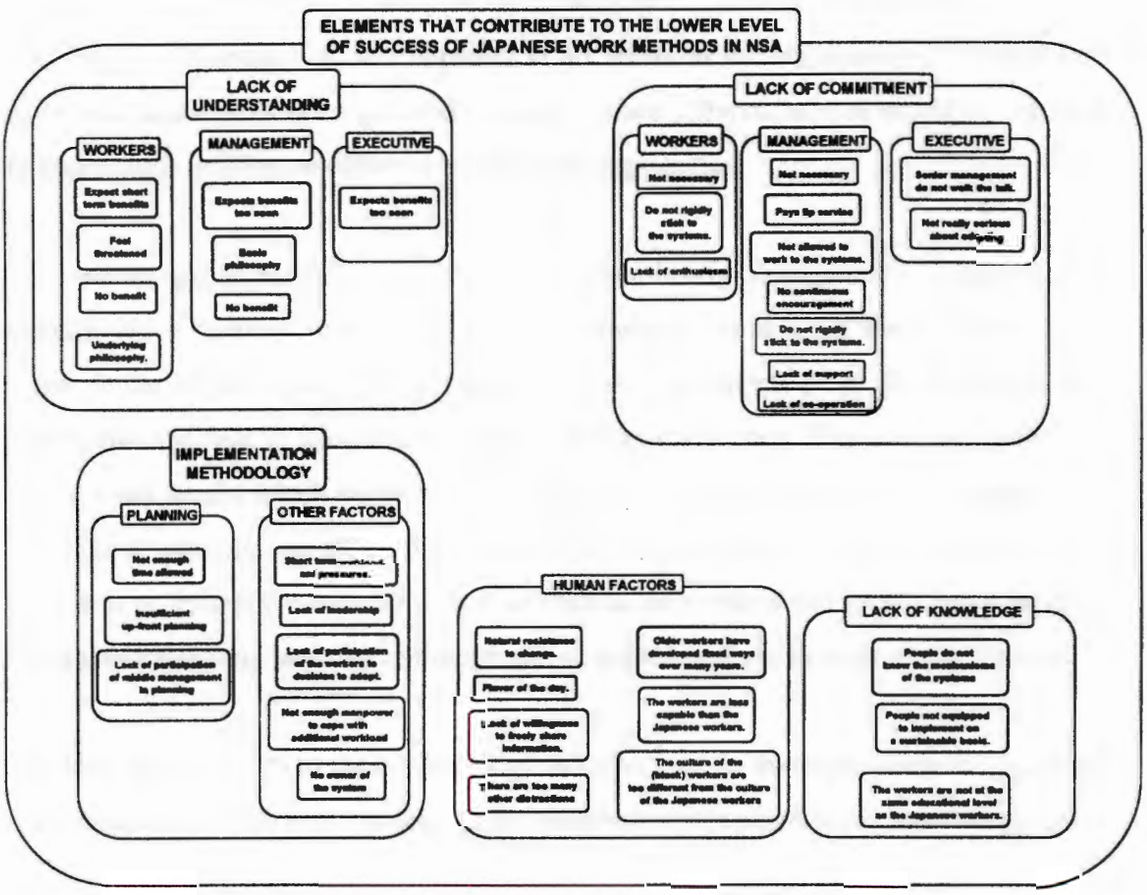
The theme the group selected for the affinity diagram was "Elements that contribute to the lower level of success of Japanese Systems in NSA."

The data gathered during the interviews as summarized above was written on data cards and these cards were then arranged in a way that grouped the cards that were alike,

together. A heading was then developed for each group to make a short, but complete statement describing the group.

The end result is shown in an affinity diagram in Figure 26. This affinity diagram can now be used to hone in, to get some general direction in the initial formulation of the explanatory hypothesis.

Figure 26 An Affinity Diagram of a Theme "Elements that Contribute to the Lower Level of Success of Japanese Systems in NSA."



From Figure 26 we can see that five groups of problems have been identified during the interviews.

The first group of contributing elements stemmed from a lack of understanding. This lack of understanding stretched across a wide range of elements, starting with a lack of

- Problems related to other factors that influenced or were influenced by the methodology applied to implement the systems.
  Some of these problems relate to the short term workload in the areas where the attempts were made to implement the systems.
  Other contributing elements related to the fact that there was no real owner of the implementation process. Although many people were involved, everybody participated and contributed in drips and drabs on an ad hoc basis.

The fourth group refers to human factors that were not recognized when the implementation was planned. These factors range from deeply entrenched work methods among the workers with longer service to the prevailing company culture that developed over time. It also includes the social and cultural aspects of the South African workers and the Japanese workers. It also includes the interplay between the various stakeholders and interest groups.

The last group of problems can be classified as problems stemming from of a lack of knowledge about the systems, their underlying philosophies as well as a lack of knowledge about the learning processes and change management in an organizational environment.

FORMULATING THE HYPOTHESIS

From the collected information and the affinity diagram in Figure 26 the following five hypotheses have been derived:-

The Japanese systems did not yield the same results in NSA as in NML and NMUK because:-

1. There is not a good level of understanding of the systems and their underlying philosophies at all levels in the organization.

2. There is not a sufficient level of commitment at all levels in the organization.

3. The implementation methodology which was followed was not well planned and there was not a sufficient level of participation by all the role players.

4. The relevant human factors were not taken into consideration during the implementation of the systems.

5. There was not a sufficient level of knowledge of the systems and their underlying philosophies at all organizational levels involved in the implementation of the systems.

ANALYSIS OF THE CAUSES

We could now have proceeded with a process of evaluating and testing all five these hypotheses, but it may be worthwhile to analyze these causes a little more in depth.
If we take a systems view of the whole process of implementation of new systems and work methods, it may be useful to look at the interaction between the various elements that have been identified and grouped. How do they influence each other? How are they influenced by each other?

A useful way to discover and illustrate these interrelationships in a complex situation like this is by showing all the causal relationships in a broad perspective. This can be achieved with the aid of a Inter-Relations Digraph, which was discussed in detail in the previous chapter.

The same group of people that developed the affinity diagram, was reconvened and given the task to investigate the causal relationships between the elements of Figure 26 with the objective of developing a Inter-Relations Digraph to illustrate these relationships.

The group elected to formulate a question to form the central objective of this specific portion of the inquiry. This question is : "Why do we not achieve the same level of success from adopting Japanese work methods?" This question ties in very closely with the central theme of this dissertation. The causal elements that would contribute towards an answer for the question and which were identified earlier in this chapter, were

arranged to enable the group to clearly identify the relationships between these elements. These relationships are indicated by the arrows in the Inter-Relations Digraph.

The explanatory hypotheses identified the elements to be explored in terms of there root causes and interrelationships. This exploration was done by the group by asking a series of why questions. This methodology is used extensively by the Japanese when they want to establish the root causes of problems. It is normally not necessary to ask the question more than five times.

The first element explored by the group was a lack of understanding.

- The lack of understanding by the workers can be caused by the fact that the workers do not want to understand. They do not want to understand due to a **lack of commitment**.
- The lack of understanding can also be because management has never explained the system to them. Management did not explain it to them because they did not think it was necessary to explain it to them or because they did not understand it themselves! The reason for this is that there was a **lack of knowledge** about the systems and its benefits.
- The lack of understanding can also be caused by management explaining it insufficiently. This can be as a result of insufficient time allowed to explain it thoroughly. This can be due to the implementation plan not taking this into account. This reflects on incorrect **implementation methodology**.

The second element which was reviewed by the group was the lack of commitment by the role players.

- This could be as a result of a **lack of understanding** or due to a lack of motivation. The lack of motivation could be because they did not see the benefit of introducing the system. This can be as a result of a **lack of understanding** or a **lack of knowledge** about the system and its benefits.
- It can also be because there is nobody to promote the system and its implementation.
- The lack of commitment can also be directly linked to a lack of knowledge. If you do not have a fundamental knowledge of something, you are unlikely to be highly committed to make it work.

The third element which was investigated by the group, was that the incorrect implementation methodology was adopted.

- This could be as a result of a lack of understanding of the organizational learning process. This could be due to a **lack of knowledge**.
- It could also be because the human processes that come into play when change is experienced, are not understood by the implementers. This is once again due to a **lack of knowledge** about these processes.

The fourth element was the human factors which were not taken into account during the implementation process.

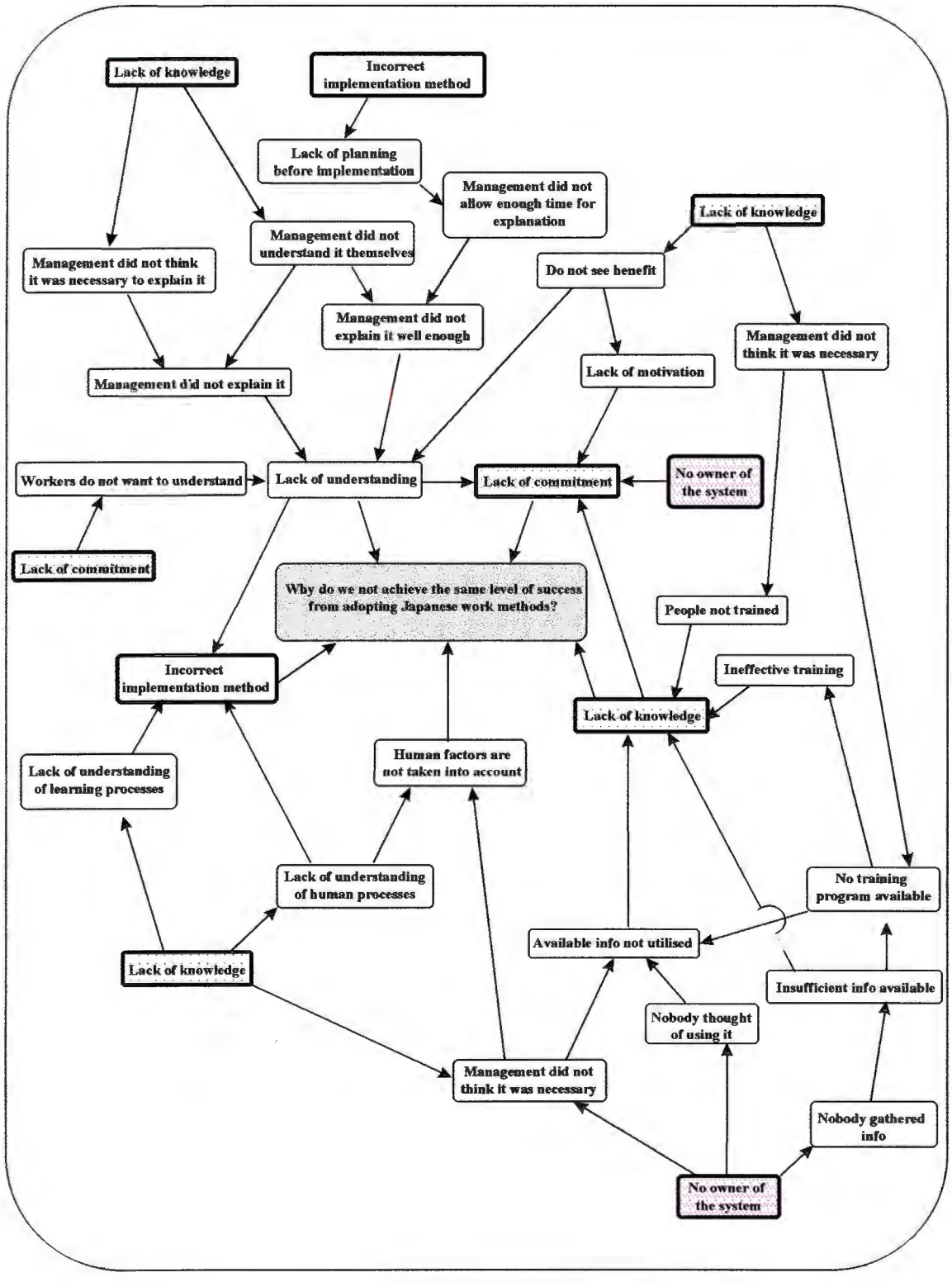
- This can be attributed to the **lack of knowledge,** discussed in the previous paragraph.
- It can also be because management did not think it was necessary to take these factors into consideration. This can be due to a lack of knowledge or just that there was no single ownership for the implementation and therefore nobody to guide management in the process.

The final element which was investigated by the group was the lack of knowledge. This element surfaced during the inquiry process of all the other elements and appears to be the one common denominator.

- The lack of knowledge can be as a result of people not being trained because management did not deem it necessary. This could once again be attributed to a lack of knowledge.
- The second possible cause is that some training has taken place, but it was not effective. This can be because there was no formal training program available because there was not sufficient information available to compile such a program. This can in turn be attributed to nobody having the personal responsibility for the successful implementation of the systems.
- The lack of knowledge can also be as a direct consequence of insufficient information being available because nobody bothered to gather and communicate the available information.
- It can also be as a result of the available information not being utilized effectively. This can once again be attributed to the lack of ownership or individual responsibility for the successful implementation of the system.

The Inter-Relations Digraph in Figure 27 summarizes the above graphically to make it easier to visualize the interrelationships between the elements.

Figure 27 Inter-Relations Digraph of a Theme "Adopting Japanese Systems and Work Methods in NSA."



By analyzing the principal causes and their relationships in Figure 27, it can be seen that it is possible to eliminate some of the formulated explanatory hypotheses.

It can be seen that the lack of understanding can be attributed to a lack of knowledge. Therefore if a sufficient level of knowledge can be attained, an adequate level of understanding should be achieved. The lack of understanding can therefore be eliminated as a primary cause of the non-achievement of the introduction of the new systems.

From the Inter-Relations Digraph it can also be seen that the lack of commitment is primarily caused by a lack of understanding of the systems and what the benefits of its adoption will be. The lack of commitment can therefore also be eliminated as a primary cause of the failure.

Further analysis indicates that the adoption of ineffective implementation methods can be attributed to a lack of understanding of various processes, including the learning process and other human processes. We can therefore deduct that if a sufficient level of understanding and knowledge exists on the relevant aspects, a more effective implementation plan can be developed.

During the process of developing the Inter-Relations Digraph the question of social cultural differences was debated at length. The conclusion was that although it may influence the implementation strategy to be followed, the principles of the Japanese work methods and systems are universal and are not exclusive to the Japanese culture. This conclusion is supported by the successful adoption of these systems in NMUK, who is seen as a benchmark of how these systems can be adopted in a Western society (Wickens, 1988).

We can therefore draw the inference that the unexpected low level of success in implementing the Japanese systems and work methods, can primarily be ascribed to a lack of knowledge.

However a second primary cause evolved during the process of analysis. The role which a single owner can play in the implementation of these new systems. The single owner will assure that the required focus can be maintained to ensure a better chance of success

in adopting Japanese work methods and systems in NSA. This principal should be considered when deciding upon an implementation strategy.

REFORMULATION OF THE EXPLANATORY HYPOTHESES

As a result of the outcome of the group review the explanatory hypotheses can now be reduced to the following:-

The Japanese systems did not yield the same results in NSA as in NML and NMUK because:-

There was not a sufficient level of knowledge of the systems and their underlying philosophies at all organizational levels involved in the implementation of the systems.

There was no defined single person accountable to drive the process.

This reformulated and simplified explanatory hypothesis can now be evaluated by using the reasoning processes of deduction and induction as suggested by the Scientific Method.

CHAPTER 9

This chapter follows on by evaluating, through a process of deductive and inductive reasoning, the validity of the hypotheses that were developed in Chapter 8. It concludes with a proposed practical experiment to physically confirm the level of accuracy of the predictions based on the explanatory hypotheses.

EVALUATION OF THE EXPLANATORY HYPOTHESES

FORMULATION OF THE PREDICTION

We can now formulate the predictions that can be experimentally verified during the inductive phase to finally confirm or reject the explanatory hypothesis. This can be achieved by formulating "If….., then ….." predictions.

Supporting the re-formulated hypothesis we can predict that:-

- If well planned, informative, needs driven training programs are developed, it would provide a base of knowledge that can result in a better understanding of the systems.

- If all the role players are trained by using these training programs, there will be a higher level of knowledge of the systems.

- If these trained role players participate in the development of an implementation plan, the developed plan will be more widely accepted by all the stakeholders.

- If the implementation of this developed plan is co-ordinated by a single responsible person through active participation of all the role players, the systems will stand a better chance to be adopted in a successful and sustained manner.

- If we rigorously apply the systems and work methods, we will achieve the same level of results that is achieved in NML and NMUK through these systems.

The above predictions would have been sufficient, if the solution to the problem was only the transfer of knowledge from those who have it (NML and NMUK) to those who do not have it (NSA). Konosuke Matsushita of Matsushita Electrical Industrial Company in Japan, stated that the reason why Western companies fail to reproduce the successes of Japanese companies lies within themselves (Matsushita, 1998). He states that the essence of management for the Western organizations, is getting the ideas out of the heads of the bosses into the hands of labor. In contrast to this, Japanese companies have realized that only by drawing on the combined brain power of **all** its employees, can an organization meet the complex and unpredictable challenges of the modern day business environment.

Russell Ackoff (Ackoff, 1995) describes the evolution of the enterprise from conceptualization as a machine, then as an organism and more recently as a social system.

After the Industrial Revolution organizations were viewed as machines, where work could be designed in such a way that those who perform it behave as though they are machines. Management therefore viewed the workers as replaceable parts of that machine and time-and-motion studies were based on this principal.

People realized that humans do however adapt to turbulence and increasing complexity better than machines. This resulted in the organization being viewed as an organism, corresponding to the biological concept of a living organism. Workers were now viewed in terms of there functions in the same way as the various organs of the body is viewed in terms of its function. The health and safety of workers became increasingly important and organized labor unions started to become more prominent.

As the skills and education required from the work force increased dramatically, more time and money were invested in training and development of the work force. As the people developed, corporate managers were made more aware of the needs and

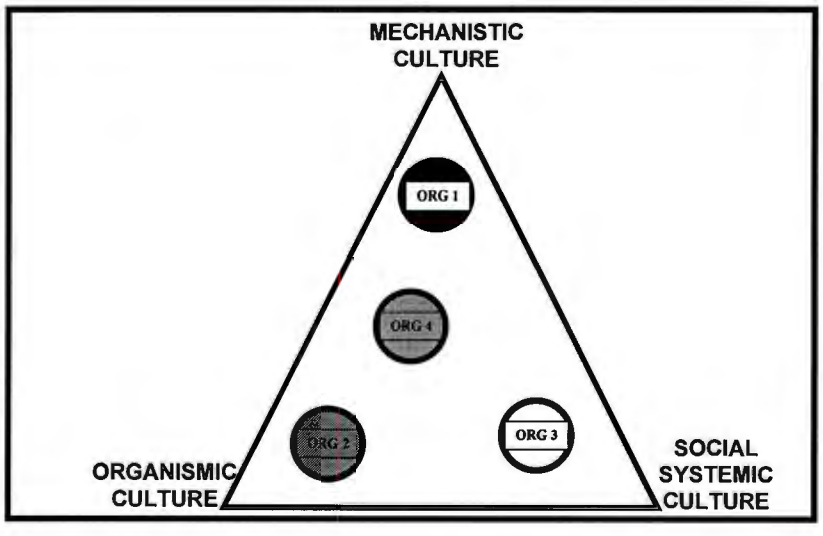
objectives of the work force. Although organizations had always consisted of people who had purposes of their own, these purposes were viewed as irrelevant in the way the organization behaved.

Corporate management started to think of organizations as social systems in which the people individually, as well as collectively played the major roles. Social systems are systems that have purposes of their own and are made up of parts that have purposes of their own. It also functions in a bigger system which has purposes of its own.

Although the conceptualization of the organization has evolved over time, all three these concepts still exist in one way or the other in the modern organization.. The way in which organizations are conceptualized has a very large effect on what they do and conversely what they do, affect the way they are conceptualized. Organizations can therefore be characterized as being more biased towards either of the three conceptualizations or sometimes referred to as corporate cultures or philosophies.

This concept is graphically represented in Figure 29.

Figure 29 Conceptualization of Organizations.



I would argue that the management philosophy in NSA is, like most of the Western organizations, more biased towards the organismic and mechanistic conceptualization. This position is depicted by Org 4 in Figure 29.

NSA's management has been forced by labor union activity and legislation to ensure that the health and safety of the workers receive the necessary attention.

Although NSA's management continuously identifies that our people is our biggest asset, this "asset" is still viewed in terms of what it can do for the company, rather than the social systemic concept of what can be done in both directions.

I refer to Chapter 6 to the system-in-use versus espoused systems. Although management's espoused system leans towards the social system concept, they are judged by their actions to confirm the actual system-in-use.
An example lies in the fact that workers are required to work short time with loss of pay when sales are low, but are expected to respond enthusiastically to produce increased volume when demand is higher. This is a typical mechanistic view, where the workers are viewed as a machine that can be switched off when it is not required.

Change can only be introduced on a sustainable basis if it is both technically feasible and culturally acceptable. This implies that the proposed system or work method must be compatible with the organizational culture as well as technically feasible.

Japanese management philosophy and the systems and work methods that follow from it, are cultivated from a social systems conceptualization, as depicted by Org 3 in Figure 29. This is confirmed by Matsushita (Matsushita, 1998) where he points out that that the Western so called "socially minded bosses" are often full of good intentions and believe that their duty is to protect the people in their firms - almost in a paternalistic way. The Japanese industry however, develop their people to defend the firm, which in turn will pay them back hundred fold for their dedication. He states that by doing this, they end up being far more social than the Western companies.

I therefore conclude that NSA's basic management philosophy needs to be fundamentally reviewed and changed, before lasting success will be achieved by implementing Japanese work methods and systems. The espoused systems which management are very quick to display at the opportune moments need to evolve and be nurtured in order for them to become the general system-in-use throughout the organization. Double-loop learning, as

described by Chris Argyris (Argyris, 1996) as discussed in Chapter 6, would then have taken place in the organization. Once this has been achieved, the proposed training and development process will be a mere formality in the road to success.

I refer to the Human Performance Tetrahedron discussed in Chapter 6. The three basic prerequisites for human beings to perform would then be in place. The resources in terms of the four M's (Man, Machine, Money and Management) would be provided. The training and development would be done according to the proposed program. The containing whole, which is the environment in which the company operates - its culture, will be conducive to adopt the Japanese systems and work methods.

FORMULATION OF AN EXPERIMENT TO TEST THE PREDICTIONS

The first test that can be applied to confirm the validity of the explanatory hypothesis is to check the experience of NMUK during their implementation of Japanese work methods and systems.

One of the principles that was fundamental in setting up NMUK was not to employ people that were previously employed in the motor industry in the UK. The key people that were employed were trained in the Japanese ways by Japanese people. In most cases the NMUK people were trained extensively in Japan to ensure that they had an in-depth knowledge and broad understanding of the underlying philosophy and theory behind the systems.
They then returned to the UK, and facilitated the implementation of the systems in NMUK with a very high degree of success.

The other very important aspect as discussed earlier in this chapter, is that the organizational culture was virtually the same as that of the Japanese companies in Japan. The work methods and systems were therefore in harmony with the Japanese management philosophy and the main focus could be directed towards the smooth operational implementation of the systems.

In NSA the proof of the pudding will lie in the eating. The best physical experiment that can therefore be conducted to test the predictions and thereby confirm or reject the explanatory hypothesis in South Africa, is to actually implement the proposed actions in NSA.

The proposals can be utilized to enhance the implementation of the re-launch of the centralized Corporate Product Planning Department in NSA. This is based on the PPD (Principal Project Designer) concept in NML. The adoption of this principle has already been accepted and the implementation has been approved by the NSA Executive.

The first step would be to present this proposal to the Director Product Planning and then to the CEO for their acceptance of the proposal. I refer to the section in Chapter 6 on Organizational learning. It is crucial to the sustained success of the system that the top structure of the organization understands, accepts and buys into the introduction of the system, before even attempting to "sell" it to the rest of the directorate. A strategy that could even emphasize the sincere intentions of the organization with the adoption of the system, could be that the CEO participates in the initial introduction to the other directors.

If we refer back to Peter Checkland's Soft Systems Management (Rosenhead, 1989) in Chapter 6, where the different roles of the stakeholders were identified, we can see that the CEO is the primary *owner* of the system. He can stop it or positively, prevent it from stopping.

The Director and the General Manager of Product Planning and their staff are the main actors in the system, since they will physically implement and maintain the system.
The Manufacturing Company and the Marketing Company are the customers of the system.

The Manufacturing Company being influenced by the system, since the system decides what they will be producing in the future, as well as the other QCD parameters to which they will be producing.

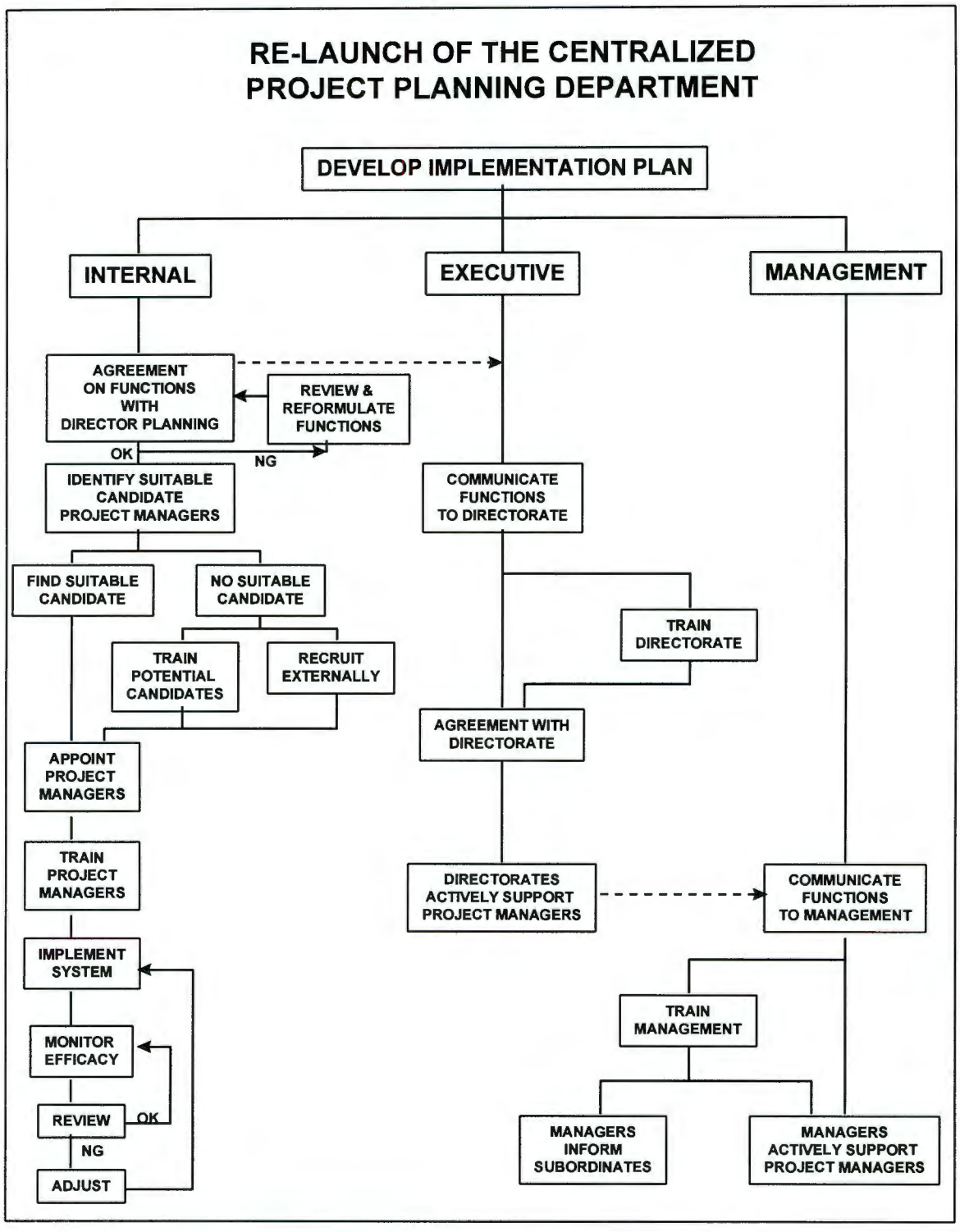
The Marketing Company is the customer in the true sense of the word, since they will be benefiting from the system, because they will hopefully get the right product at the right QCD levels to sell in the target market.

The introduction process can be sub-divided into three stages of activities.

- The first stage being the internal development and staffing of the Product Planning Office.
- The second stage is the introduction of the function to the directorate and soliciting their support to enable us to go to the final stage.
- The final stage is the introduction of the function to line management and to confirm their co-operation.

This process is illustrated with the aid of a PDPC in Figure 30.

Figure 30 **A Pre-Planned PDPC for the Re-Launch of the Centralized Product Planning Office.**



The next step would be to develop a training program to ensure that all the stakeholders will have sufficient knowledge and understanding of the system to ensure its successful introduction.

This process starts with a review of the available information on a system of centralized product planning. If sufficient information is not available, more information on exactly

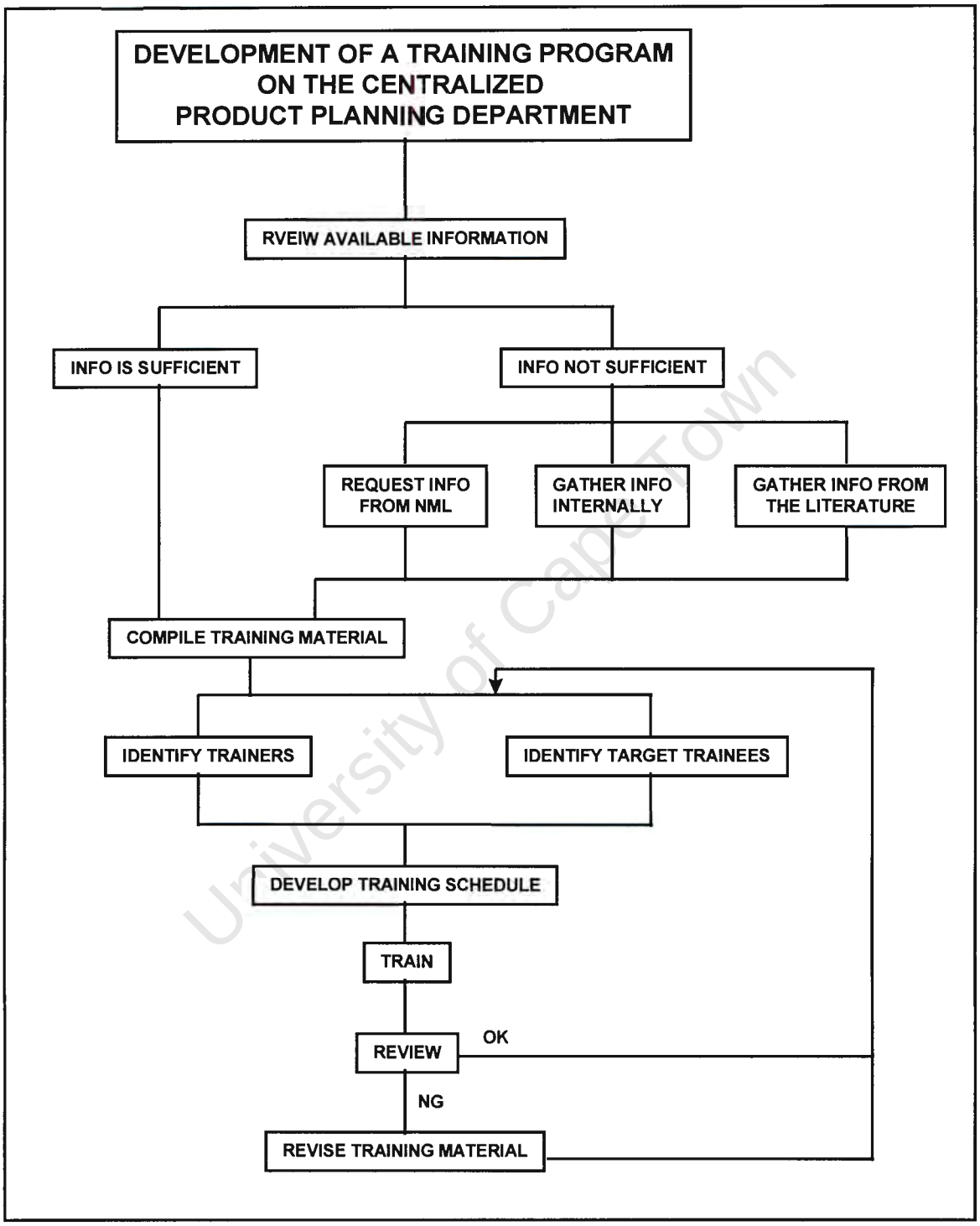
how the NML PPD system operates can be obtained from NML. The relevant literature can also be studied or a review of historical data in NSA can be conducted, to establish sufficient information to enable us to compile a training guide. Based on this information and the necessary adaptation to suit NSA's specific requirements, a training program will be developed in conjunction with the Human Resource Development Department and the members of the Product Planning Department.

The people that will conduct the training program will be identified in conjunction with the Training Department and groups and individuals will be identified for training, in co-operation with the directorate and line management.

A training schedule will be compiled and the training will commence. After the first training sessions have been completed, the efficacy of the training program will be reviewed and the program will be revised, if required. This review and revise cycle will be conducted on an on-going basis in line with the PDCA cycle, which was discussed in Chapter 6.

The development of this program is illustrated in Figure 31.

Figure 31 **A Pre-Planned PDPC for the Development of a Training program to Introduce the Centralized Product Planning Office to NSA.**



During the development of the training program the principles of the learning process as described in Chapter 6 should be applied where-ever possible. A very useful tool to

explain the role of the PPD, would be to use the Viable Systems Model and possibly the Work Systems Methodology as described in Chapter 6.

A VSM was developed to show the role of the Product Planning Department in the organization. If we look at Recursion Level 0, we look at the Automakers situation. The Product Planning Department gathers information, utilizing internal and external sources in terms of what the market wants, what is available from the source companies, what needs to be made available from the source companies and what needs to be developed locally. They then further identify through the various divisional inputs, the resources that would be required to meet these needs. They provide the necessary support to the divisions, to ensure that all divisional inputs use the same base parameters and are in a common format.

Figure 21 shows Recursion Level 0 in a graphical format.

The model was expanded to Recursion level 1's for the Manufacturing as well as for the Marketing Company. The Recursion Level 1 diagram for the Manufacturing Company, shown in Figure 32, clearly indicates the different roles of the Product Planning Department and the current Project Office. The Product Planning Department functions on an overall strategic level, while the current Project Office will focus on the operational detail within the Manufacturing activities. Obviously these two areas will need to work very closely, to ensure the successful introduction of the new models.

The Recursion Level 1 diagram for the Marketing Company shown in Figure 33, indicates the difference in the function of the current Market Planning Department and the Product Planning Department. Once again the Market Planning Department functions at a more operational level with the Sales Department and other divisions in Marketing.

Figure 21 **Viable Systems Model of Automakers Showing the Role of Product Planning in the organization.**

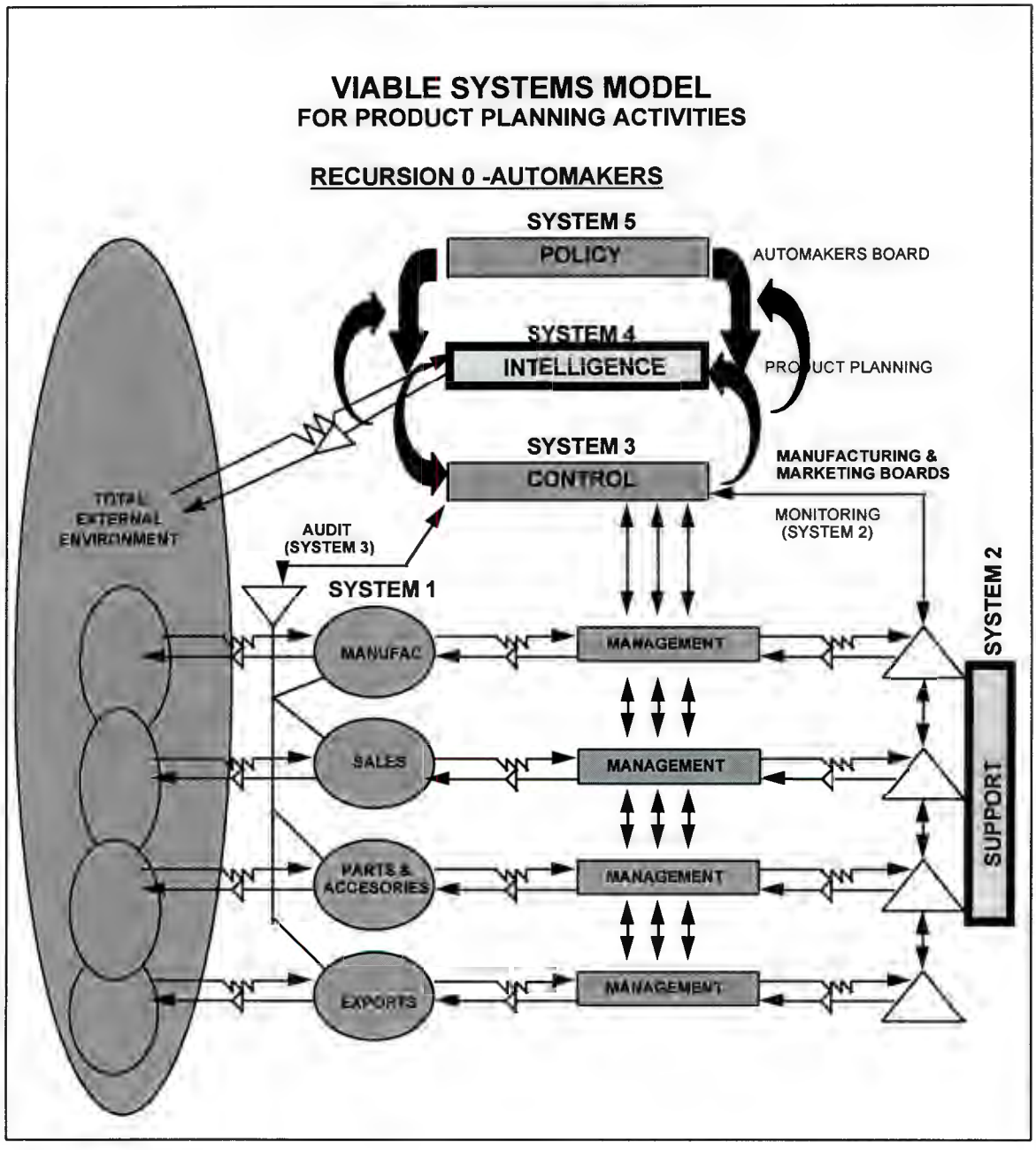


Figure 32 **A VSM Showing Recursion Level 1 of the Manufacturing Company.**

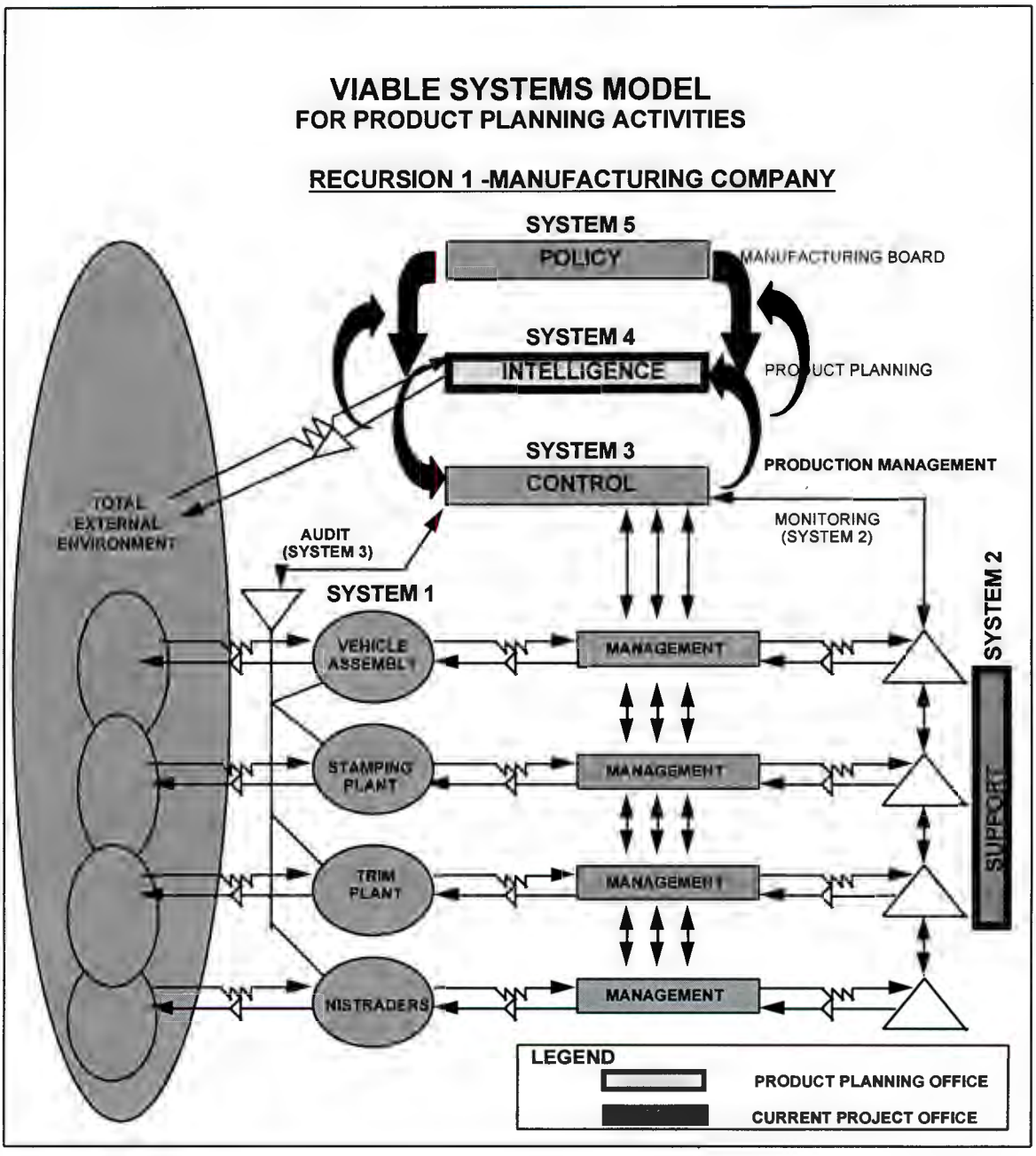
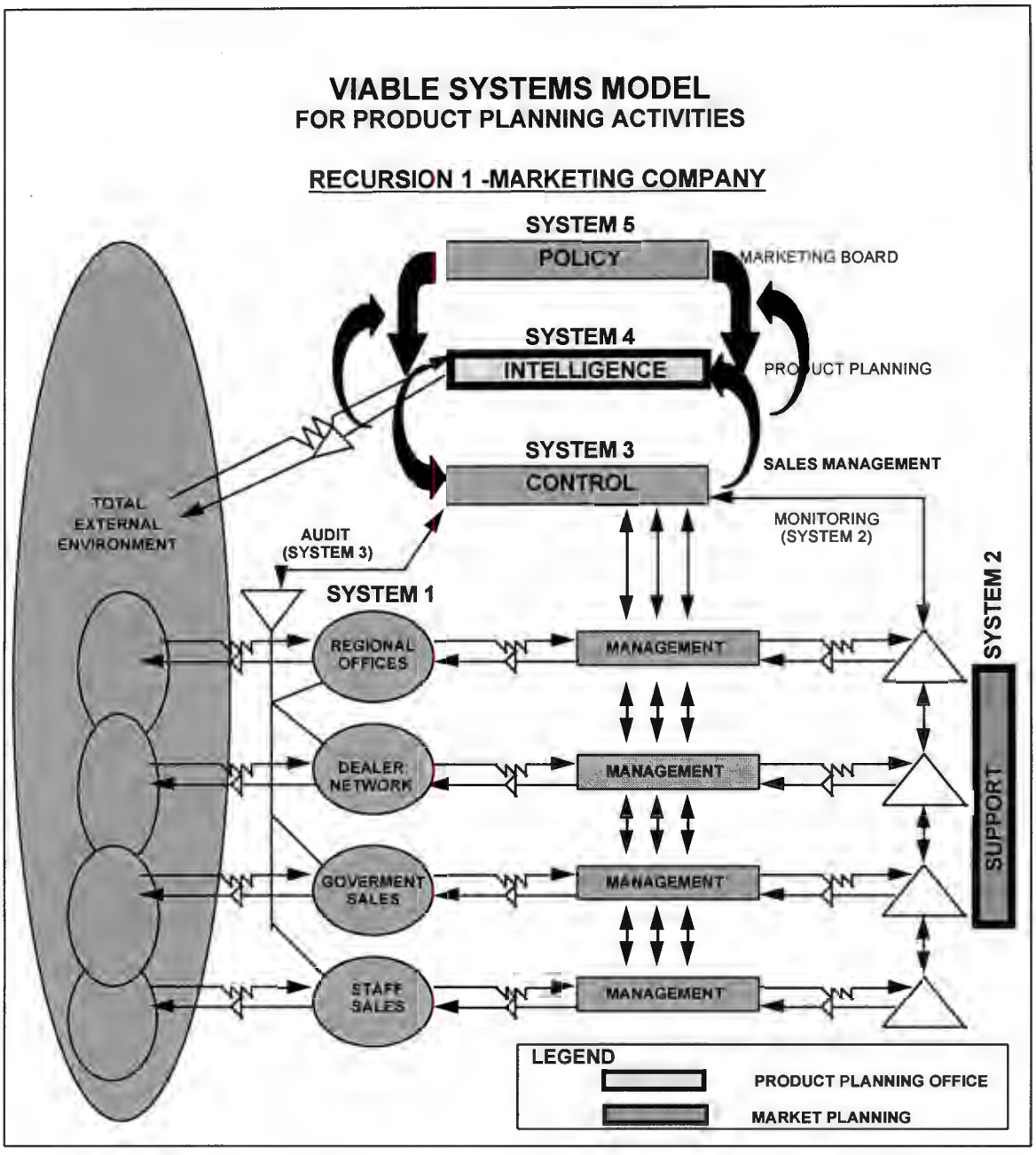


Figure 33 A VSM Showing Recursion Level 1 of the Marketing Company.



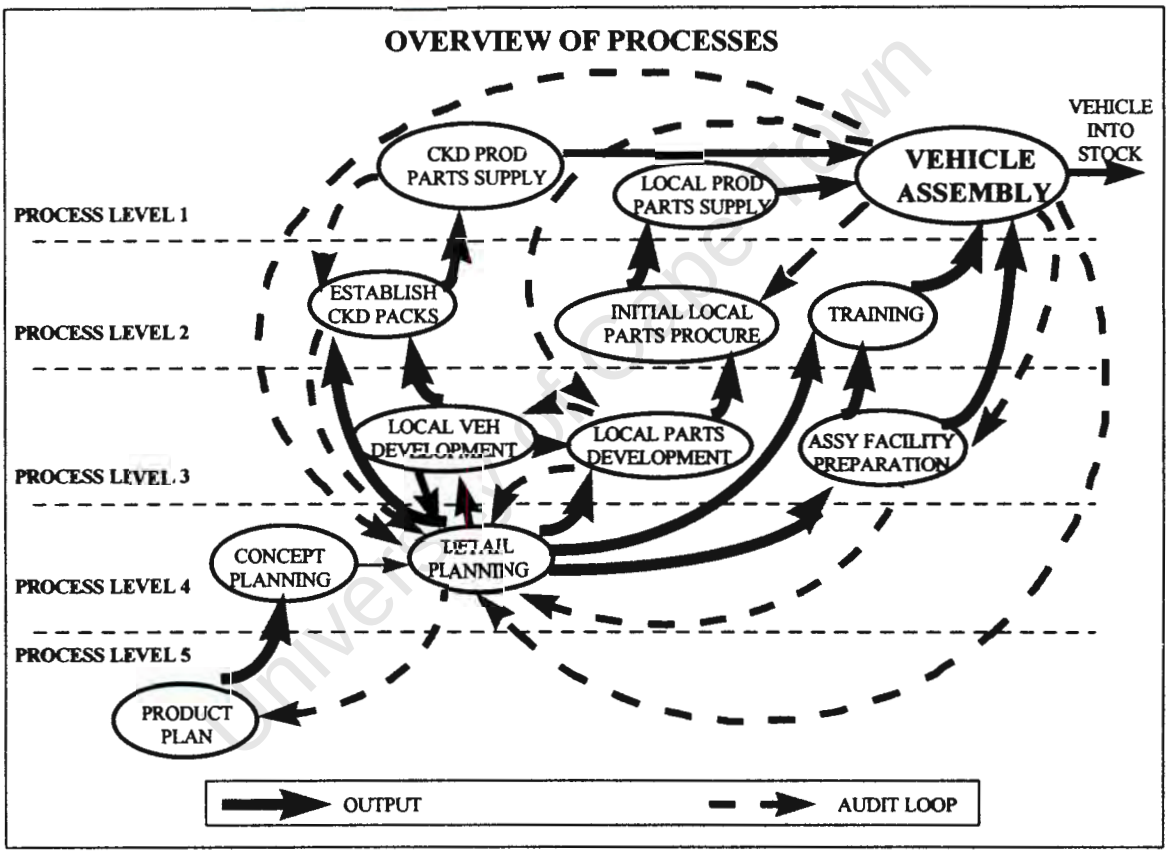
The above VSM's should help to clarify the role of the Product Planning Department in the organization and will be used during the information sessions as well as in the training programs.

A further model that can assist to clarify the role of the product planning activities in the organization, is to define the process levels that come into play during the preparation

activities for a new model introduction, by using the methodology developed by Hoebeke. This methodology was described in more detail in Chapter 6.

Figure 34 illustrates these process levels in a graphical format and is self explanatory. It can clearly be seen that the product planning activities take place at a relatively high process level, although it has an effect on most of the processes - right down to the day-to-day activities of building cars.

Figure 34 Process Levels in Introducing a New Model in NSA.



All the people that will be involved in implementing the system, will be trained by using these training programs. We will start at the executive level and work our way down through the organizational hierarchy.

Once all the roll players have been trained, they will participate in the development of an enhancement plan to improve the system and its acceptance throughout the company.

The General Manager of the department will be appointed as the champion (single accountable person) for the implementation of the system.

He will then have the responsibility to ensure that everybody will rigorously adhere to the implementation plan.

Once the system is up and running he will remain responsible to ensure that people keep on working to the system on an on-going basis and that the system becomes part of their mental model-in-use and not just remain as an espoused mental model.

CHAPTER 10

In this chapter the writer attempts to synthesize the total process, by reflecting on the total process with some practical comments.

CONCLUSIONS

After the initial formulation of the five explanatory hypotheses, I went into the process of evaluation through the deductive reasoning process. It then came to light that there was a great degree of overlap of these hypotheses. This resulted in returning to the abductive phase and developing the Inter-Relations Digraph in Figure 27, with the subsequent rationalization of the explanatory hypotheses.

This clearly illustrates the fact that there is no single final solution and that the process should be seen as a series of continuous loops of PDCA cycles. This supports Peirce's view that the ultimate truth is never achieved, but the more loops we do the closer we will get to the ultimate truth.

RECOMMENDATIONS

Management must be aware of the multiple perspectives that are relevant in the organization when implementing changes.

There are 2 basic requirements for the sustained successful implementation of any new system

- It must be systemically viable
- It must be culturally acceptable

All proposed changes should be assessed against these criteria prior to implementation.

The recommendation is to list all possible changes that need to take place in the process of adopting the proposed system and then evaluating them by utilizing the SSM (Rosenhead, 1989) as described in Chapter 6, to facilitate the process.

Changes that have been identified as being both systemically desirable and culturally feasible can be grouped together for implementation.
The implementation process can utilize the principles of SSM which may then result in a "re-cycle" of the whole process which supports the basic philosophy that there is no permanent solution for any problem.

SUMMARY

Although the framework was utilized to address a specific problem - The inquiry into adopting Japanese systems and work methods in NSA, I tried to develop and describe the framework in a way that hopefully makes it universal in its application. Obviously different theories, methodologies and techniques may be used which are applicable to the specific inquiry, but the SCQARE framework, the Scientific Method and the theories relating to learning would probably be included in most of the possible inquiries.

The other important fact that needs to be re-emphasized is that any changes which are required to address the problem must fit in with the fundamental management philosophy of the organization. If we refer back to the learning cycle as depicted in Figure 1, we can see that there is a fundamental inter-relationship between the philosophy and the methodology which are relevant in a specific situation. It is therefore a basic requirement that the underlying philosophy behind the proposed change and the underlying management philosophy, which is relevant in the organization, must at least be compatible to some extent.

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